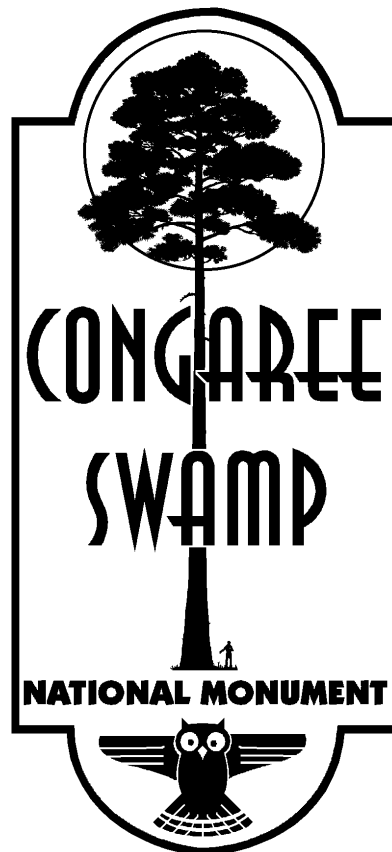


**NATIONAL PARK SERVICE**  
**Environmental Assessment**  
**of the**  
**CONGAREE SWAMP NATIONAL MONUMENT**  
***Draft***  
**Wildland Fire Management Plan**



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This Draft Environmental Assessment evaluates alternatives and associated environmental impacts arising out of the proposed implementation of a Wildland Fire Management Plan at Congaree Swamp National Monument.

#### Comments and Availability

Comments on this Draft Environmental Assessment ("EA") for the Wildland Fire Management Plan at Congaree Swamp National Monument must be delivered or postmarked no later than September 15, 2003.

If you wish to comment on this environmental assessment, you may mail comments to the name and address below. Our practice is to make comments, including names and home addresses, available for public review during regular business hours. Individual respondents may request that we withhold their names and/or home address from the record, which we will honor to the extent allowable by law. If you wish us to withhold your name and/or address, you must state this prominently at the beginning of your comment. We will make all submissions from organizations or businesses, and from individuals identifying themselves as representatives or officials of organizations or businesses, available for public inspection in their entirety.

Address all comments to:

Superintendent  
Congaree Swamp National Monument  
100 National Park Road  
Hopkins, South Carolina 29061-9118

FAX: 803-783-4241

Comments may also be submitted by e-mail to: [COSW\\_Superintendent@nps.gov](mailto:COSW_Superintendent@nps.gov)

The Draft EA is available for public review at the following location:

Congaree Swamp National Monument  
100 National Park Road  
Hopkins, South Carolina 29061-9118

The Draft EA can also be viewed and downloaded at [www.nps.gov/cosw](http://www.nps.gov/cosw). Printed copies of the Draft EA can be requested from the National Park Service at the address above or by contacting Patrick Dege at (803) 776-4396 x 17.

**Important Notice:** Reviewers should provide the National Park Service (NPS) with their comments on the draft EA during the review period. This will allow NPS to analyze and respond to comments at one time and to use information acquired in the preparation of a Final EA, thus avoiding undue delay in the decision-making process. Reviewers have an obligation to structure their participation in National Environmental Policy Act process so that it is meaningful and alerts the agency to the reviewer's position and contentions. Environmental objections that could have been raised at the draft stage may be considered waived if not raised until completion of the Final EA. Comments on the Draft EA should be specific and should address the adequacy of the analysis and the merits of the alternatives discussed. 40 CFR 1503.3.

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## **1.0: PURPOSE AND NEED**

### **1.1 *Purpose of the Action***

The purpose of implementing a wildland fire management plan ("WFMP") at Congaree Swamp National Monument is, first and foremost, to protect human life and property, both public and private, within and adjacent to National Park Service (NPS) lands. The fire management plan is also intended to protect and preserve the natural and cultural resources of the Monument for the enjoyment of present and future generations. This includes perpetuation of the ecosystem in which these resources occur. To help in achieving these long-term goals, the National Park Service has implemented a comprehensive fire management program. Actions within this program include, but are not limited to, fuels reduction, prescribed fire for resource benefit, and wildland fire suppression.

This environmental assessment addresses the proposed action to manage wildland fire and reduce fuel loads in Congaree Swamp National Monument (the "Monument"). The northern boundary of Congaree Swamp National Monument contains thick surface and aerial fuels and is subject to prevailing winds from the north and west. In addition to these factors that may lead to potentially extreme fire behavior, park boundaries are adjoined by numerous private properties, some of which have houses located within 100 feet of the Monument's boundary. The presence in and adjacent to the Monument of contemporary and historic development necessitates hazard fuel accumulations reduction inside the Monument and along the boundary lines to prevent loss of life, damage to property, or harm to Monument resources.

The purpose of this federal action is to provide a long-range fire management plan and program utilizing the benefits of fire to achieve desired natural resource conditions while protecting park resources and surrounding lands from fire. This action would create buffer zones with low fuels availability between the Monument wildlands and development inside and outside of the Monument. The reduction of fuels within the Monument would decrease the intensity of a fire and should increase the firefighter's ability to gain control of a wildland fire whether originating from inside or outside Monument boundaries. The use of prescribed fires would also re-establish fire as an ecological process that would help to restore and maintain natural biotic systems and reduce exotic vegetation.

### **1.2 *Need for the Action***

NPS proposes to implement the Federal Wildland and Prescribed Fire Management Policy Guidelines, with the associated changes of terminology and implementation procedures. To do so, it is necessary that fire management plans reflect new direction. The preparation of a Wildland Fire Management Plan is required by the NPS Wildland Fire Management Guidelines (DO-18), which states: "All parks with vegetation that can sustain fire must have a fire management plan. The resource management objectives of the park may determine whether a prescribed fire component is needed."

As an action plan, the WFMP for the Congaree Swamp National Monument will delineate the Monument's fire management program and serve as an addendum to the Resource Management Plan.

The initial FMP for the Monument was developed and adopted in 1988. Since that time changes in Regional and National policies, extensive disturbance from Hurricane Hugo, and an authorized boundary expansion from 15,135 acres to 22,200 acres occurred. A new FMP was developed and approved in 1995-96. Fire is not static and fire management policy must keep up with the ever-changing fire research and policies. It is essential to update and revise the FMP to incorporate new information on fire management programs and fire ecology, as well as maintain compliance with NPS policy.

Congaree Swamp National Monument needs this plan to guide management decisions in response to wildland fire incidents occurring within the Monument and adjacent to the area's boundary. The size and configuration of the Monument's land base eliminates the option of wildland fire use for resource benefit (formerly known as prescribed natural fire) to obtain other resource objectives that may be possible in a park with a larger aggregate acreage. Instead, the preferred alternative, in compliance with current federal policy (NPS 2001), proposes to continue to use a prescribed fire component that would enhance the Monument's ability to manage and improve ecosystem components and processes while providing for firefighter and public safety.

As per the National Park Service's "Wildland Fire Management Guidelines" (DO-18, 1998) this

*... Environmental Assessment developed in support of the fire management plan will consider effects on air quality, water quality, health and safety, and natural and cultural resource management objectives.*

This Environmental Assessment will also explore the ways in which the Monument's fire management program can be carried out in concurrence with NPS policy and other pertinent management directives at Congaree Swamp National Monument.

### **1.3 Laws, Regulations, and Policies and the Planning Process**

A contributing factor to the amount of damage resulting from wildland fires has been the growth of communities in areas adjacent to national parks and other public lands. Developments in these areas put human life, homes, and other property at risk. Fire management plans and fuel reduction activities in the wildland-urban interface are intended to reduce the risk of wildland fire in national parks and potential damage to properties in areas where wildlands adjoin developed areas.

Under the management policies for the National Park Service which include Director's Order -18 and the corresponding Reference Manual -18 (NPS 1998a), wildland prescribed fire management policy requires that all parks with vegetation capable of supporting fire must develop a fire management plan. A fire management plan



implements the selected management actions from the park's Resource Management Plan (2002).

Authority for carrying out a fire management program at Congaree Swamp National Monument originates with the Organic Act of the National Park System, August 25, 1916. The Organic Act mandates that the National Park Service:

*... promote and regulate the use of the Federal areas known as national parks, monuments, and reservations ... by such means and measures as to conform to the fundamental purpose of said parks, monuments, and reservations, which purpose is to conserve the scenery and the natural and historic objects and the wild life therein and to provide for the enjoyment of the same in such manner and by such means as will leave them unimpaired for the enjoyment of future generations. (6 U.S.C. 1).*

Prior to the implementation of activities described in the fire management plan, the proposed actions and their alternatives must be evaluated in environmental assessments. These evaluations will be technically and legally defensible and in full compliance with the requirements of:

- The National Environmental Policy Act of 1969 (NEPA), as amended.
- The Council of Environmental Quality's (1978) "Regulations for Implementing the Procedural Provisions of the National Environmental Policy Act," published in 40 *Code of Federal Regulations (CFR)* 1500-1508.
- *Director's Order #12 and Handbook: Conservation Planning, Environmental Impact Analysis, and Decision-Making* (NPS 2001a).
- Section 106 of the National Historic Preservation Act.
- The Advisory Council on Historic Preservation's Section 106 Regulations, "*Protection of Historic Properties*," (36 *CFR* 800).
- Director's Order #18, *Wildland Fire Management* (NPS 1998a). This order states, in part that:

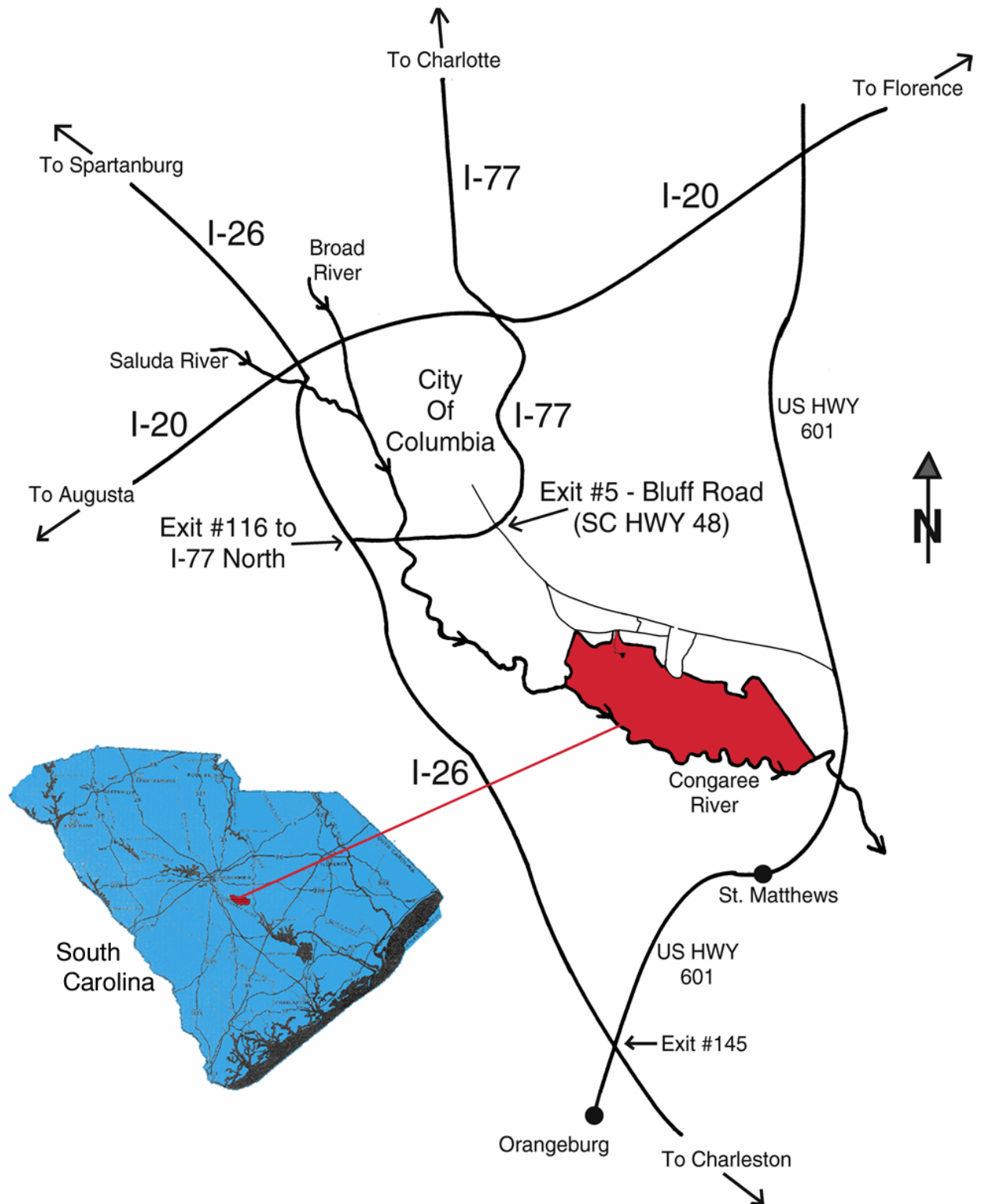
*Wildland fire may contribute to or hinder the achievement of park management objectives. Therefore, park fire management programs will be designed to meet resource management objectives prescribed for the various areas of the park and to ensure that firefighter and public safety are not compromised. Each park with vegetation capable of burning will prepare a fire management plan to guide a fire management program that is responsive to the park's natural and cultural resource objectives and to safety considerations for park visitors, employees, and developed facilities.*

- Section 6.3.9 of NPS *Management Policies* (2001) ("Fire Management"), which states, in part:  
*Actions taken to suppress wildland fires will use the minimum requirement concept, and will be conducted in such a way as to protect natural and cultural resources and to minimize the lasting impacts of the suppression actions.*
- Director's Order #28, Cultural Resource Management Guidelines (NPS 1998b).

This environmental assessment was prepared in compliance with the National Environmental Policy Act of 1969 and its implementing regulations. The environmental assessment is being made available to the public for a 30-day review. Upon completion of this review, the National Park Service will assess all public comments, and if necessary, modify the environmental assessment. A Finding of No Significant Impact (FONSI) would then be issued finalizing the decision, or, if the potential for significant impacts are identified, a Notice of Intent (NOI) would be publicized in the Federal Register for preparation of an Environmental Impact Statement (EIS).

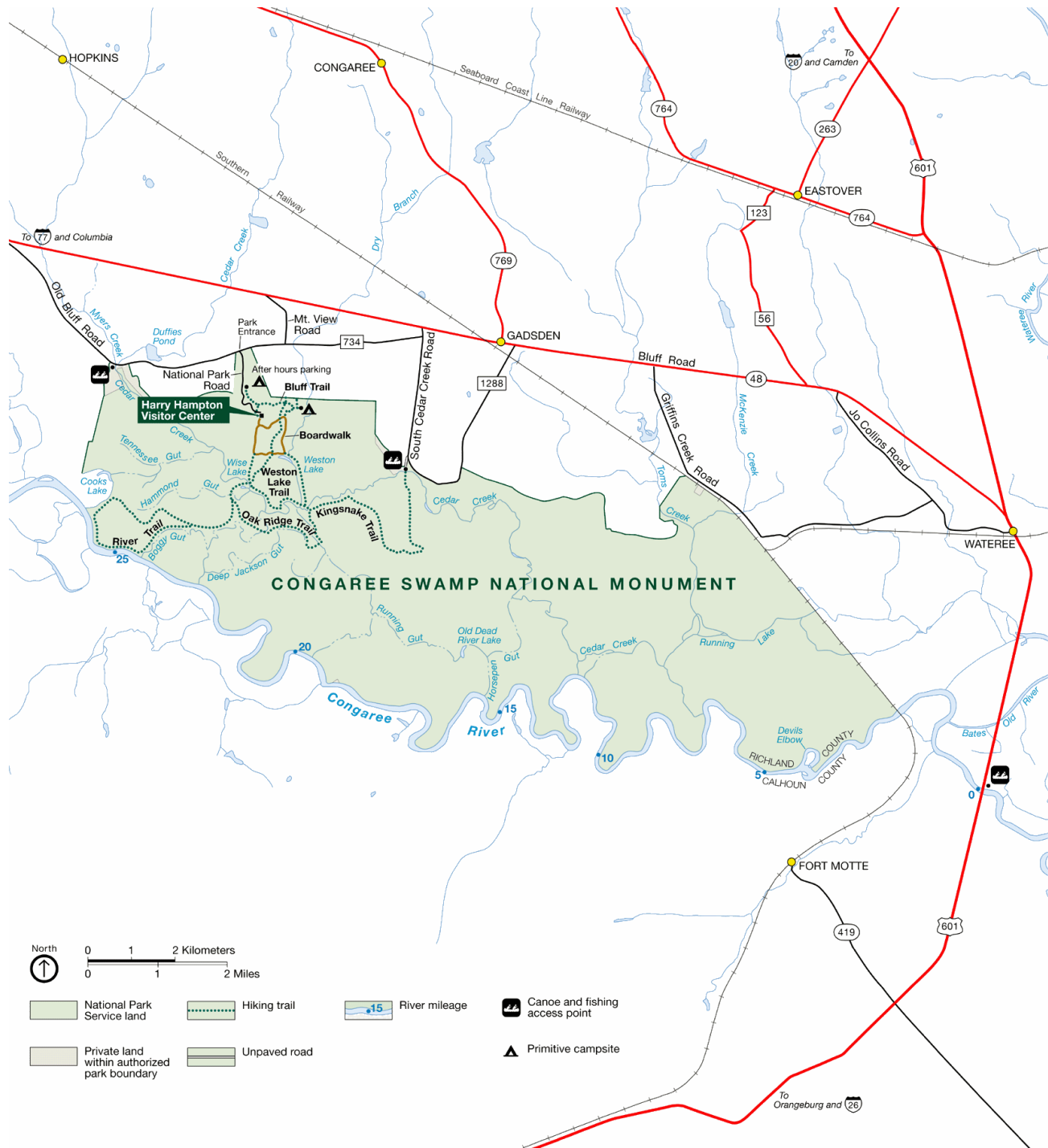
This environmental assessment evaluates specific actions to suppress wildland fire and treat fuel accumulations in the Monument. It is also a programmatic environmental assessment in that it establishes a direction for overall fire management within the monument. Additional compliance may be necessary for site-specific actions where the potential for sensitive resources exists or the action is in an area or is of a nature that creates a public concern. The public would be notified of any such proposals prior to implementation.

Figure 1: Congaree Swamp National Monument - General Location Map



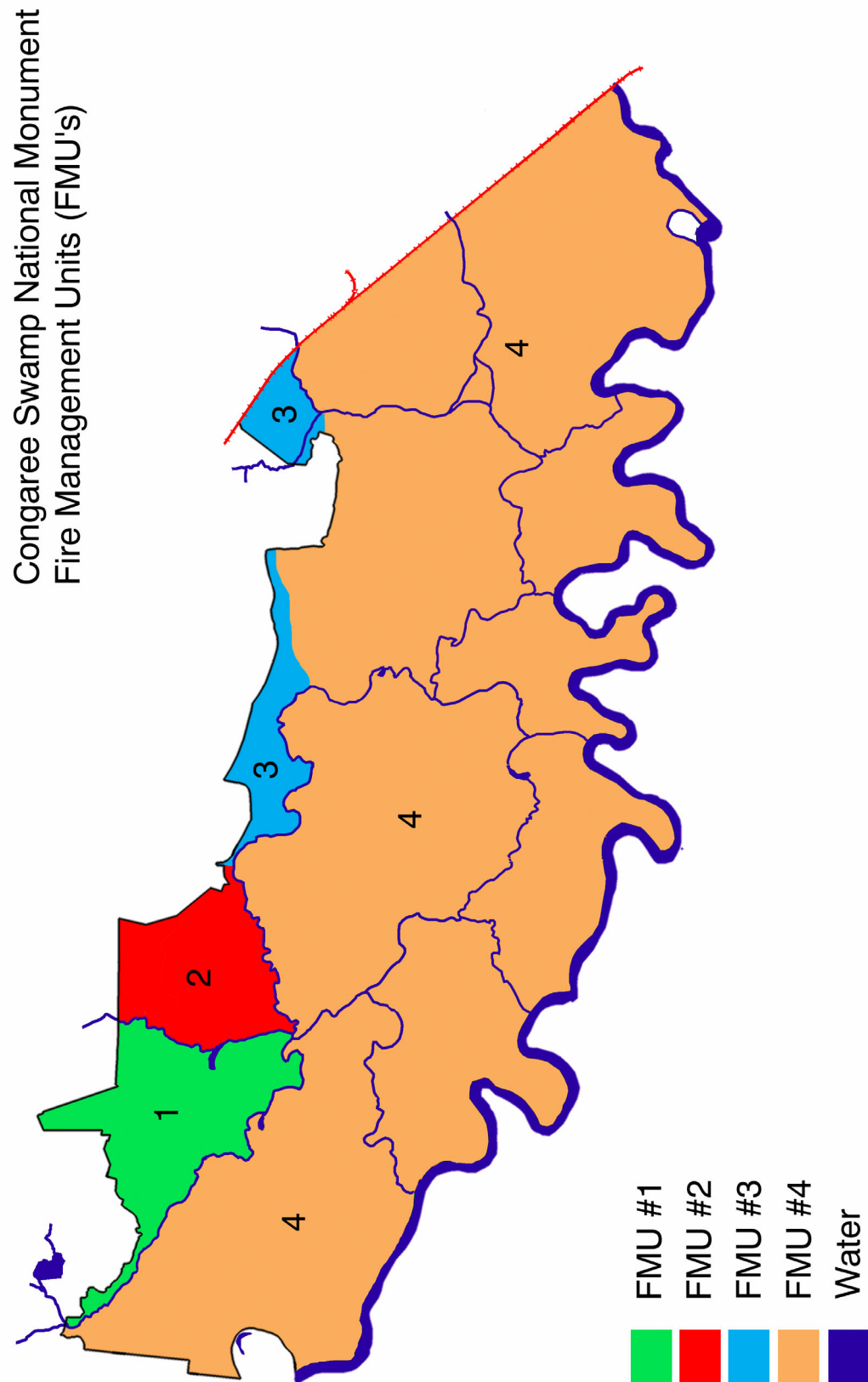
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Figure 2: Congaree Swamp National Monument - Specific Location Map



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Figure 3: Congaree Swamp National Monument - Fire Management Unit Map



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## **2.0: ISSUES AND IMPACT TOPICS**

Issues and concerns affecting this proposal were identified from past NPS planning efforts, environmental groups, and input from other state and federal agencies. Major issues include conformity of the proposal with the requirements of the Congaree Swamp Expansion and Wilderness Act; possible introduction or dispersal of exotic species; and potential impacts of the proposed action on natural and cultural resources, visitor use and experience, and monument operations.

Specific impact topics were developed to focus discussion of environmental consequences and to allow comparison of the impacts of each alternative. These impact topics were identified based on federal laws, regulations, and Executive Orders, as well as NPS *Management Policies* (2001) and NPS knowledge of limited or easily affected resources. A brief rationale for the selection of each impact topic is given below, together with the rationale for dismissing specific topics from further consideration.

### **2.1: Impact Topics Analyzed in this Environmental Assessment**

**Soils:** According to the National Park Service's *Management Policies* (2001), the National Park Service will strive to understand and preserve the soil resources of park units and to prevent, to the extent possible, the unnatural erosion, physical removal, or contamination of the soil or its contamination of other resources. Equipment used in fire suppression and fuel management activities can result in disturbance to soil resources. Therefore, soils will be addressed as an impact topic in this environmental assessment.

**Vegetation:** The National Environmental Policy Act (42 U.S.C. 4321 *et seq.*) calls for an examination of the impacts a proposed action may have on all components of affected ecosystems. National Park Service policy is to maintain all of the components and processes of naturally occurring ecosystems, including the natural abundance, diversity, and ecological integrity of plants and animals (National Park Service *Management Policies* 2001).

Decisions about when and where to conduct prescribed fire and fuel management activities could have long-term effects on the vegetation associations of the northern bluff. In addition, use of mechanized firefighting and fuel management equipment could cause short-term impacts to vegetation in the Monument. Therefore, vegetation will be addressed as an impact topic in this environmental assessment.

**Wildlife and Special Status Species:** As noted above, NPS policy requires the protection and perpetuation of naturally occurring wildlife and ecosystems. In addition, the Endangered Species Act requires an examination of impacts on all federally-listed threatened or endangered species. National Park Service policy also requires an assessment of the impacts on all federal candidate species, as well as state-listed threatened, endangered, candidate, rare, declining, and sensitive species. The federally-listed threatened or endangered species, candidate species, and species of

special concern that may be potentially found in the Monument include those listed in table 1.

**Table 1 – Threatened, Endangered, and Listed Species in COSW**

| Scientific Name                   | Common Name                  | Federal Listing<br>(T, E, P or C)* | State Listed<br>Species |
|-----------------------------------|------------------------------|------------------------------------|-------------------------|
| <i>Haliaeetus leucocephalus</i>   | Bald eagle                   | T                                  | X                       |
| <i>Mycteria americana</i>         | Wood stork                   | E                                  | X                       |
| <i>Picoides borealis</i>          | Red-cockaded woodpecker      | E                                  | X                       |
| <i>Accipiter cooperii</i>         | Cooper's hawk                |                                    | X                       |
| <i>Aimophila Aestivalis</i>       | Bachman's sparrow            |                                    | X                       |
| <i>Botrychium lunarioides</i>     | white grapefern              |                                    | X                       |
| <i>Carex cherokeensis</i>         | Cherokee sedge               |                                    | X                       |
| <i>Carex crus-corvi</i>           | ravenfoot sedge              |                                    | X                       |
| <i>Carex socialis</i>             | social sedge                 |                                    | X                       |
| <i>Cayaponia quinqueloba</i>      | fivelobe cucumber            |                                    | X                       |
| <i>Clemmys guttata</i>            | spotted turtle               |                                    | X                       |
| <i>Collinsonia serotina</i>       | Walter's whorled horsebalm   |                                    | X                       |
| <i>Condylura cristata</i>         | Star-nosed mole              |                                    | X                       |
| <i>Crotalus horridus</i>          | Timber rattlesnake           |                                    | X                       |
| <i>Dendroica virens</i>           | Black-throated green warbler |                                    | X                       |
| <i>Dryopteris carthusiana</i>     | spinulose woodfern           |                                    | X                       |
| <i>Egretta caerulea</i>           | Little blue heron            |                                    | X                       |
| <i>Elanoides forficatus</i>       | American swallow-tailed kite |                                    | X                       |
| <i>Ictinia mississippiensis</i>   | Mississippi kite             |                                    | X                       |
| <i>Lanius ludovicianus</i>        | Loggerhead shrike            |                                    | X                       |
| <i>Lasiurus cinereus</i>          | Hoary bat                    |                                    | X                       |
| <i>Limnothlypsis swainsonii</i>   | Swainson's warbler           |                                    | X                       |
| <i>Macbridea caroliniana</i>      | Carolina birds-in-a-nest     |                                    | X                       |
| <i>Melanerpes erythrocephalus</i> | Red-headed woodpecker        |                                    | X                       |
| <i>Myotis lucifugus</i>           | Little brown myotis          |                                    | X                       |
| <i>Rana palustris</i>             | Pickerel frog                |                                    | X                       |
| <i>Sciurus niger</i>              | Eastern fox squirrel         |                                    | X                       |
| <i>Urtica chamaedryoides</i>      | weak nettle                  |                                    | X                       |

\*T= Threatened species, E = Endangered species, P= Potential species, C = Candidate species

Decisions about when and where to conduct prescribed fire and fuel management activities could have short and long-term effects on the federally-listed threatened or endangered species, candidate species, and species of special concern of the Monument. In addition, use of mechanized firefighting and fuel management equipment could cause disruptions of short duration to these populations. Therefore, the topic of threatened, endangered and candidate species, and species of special concern will be addressed as an impact topic.

**Air Quality:** Section 118 of the Clean Air Act, as amended (33 U.S.C. 7401 *et seq.*) requires each park unit to meet all federal, state, and local air pollution standards. Congaree Swamp National Monument is designated as a Class II air quality area under the Clean Air Act. A Class II designation indicates the maximum allowable increase in concentrations of sulfur dioxide and particulate matter over baseline concentrations, as specified in Section 163 of the Clean Air Act. Further, the Act provides that the federal land manager has an affirmative obligation to protect air quality-related values (including visibility, plants, animals, soils, water quality, cultural resources, and visitor health) from adverse pollution impacts.

Decisions about when and where to conduct prescribed fire and fuel management activities could affect concentrations of sulfur dioxide and particulate matter that is released into the air. Therefore, air quality will be addressed as an impact topic in this environmental assessment.

**Cultural Resources:** The National Historic Preservation Act, as amended in 1992 (16 U.S.C. 470 *et seq.*); the National Environmental Policy Act of 1969 (42 U.S.C. 4321 *et seq.*); the National Park Service's Director's Order #28, *Cultural Resource Management Guideline* (1997); *Management Policies* (2001); and Director's Order #12, *Conservation Planning, Environmental Impact Analysis, and Decision Making* (2001) require the consideration of impacts on cultural resources (i.e., archeological resources, cultural landscapes, ethnographic resources, historic and prehistoric structures, and museum collections) listed in or eligible for listing in the National Register of Historic Places.

The area in and around Congaree Swamp National Monument has been inhabited by humans for thousands of years, and various archeological sites have been located within Monument boundaries. In certain circumstances, the activities called for in the WFMP could result in subsurface ground disturbance or injury to archeological sites. In addition, researchers in the Monument have identified a number of historic structures, 9 of which have been included in the National Register. These structures include levees and cattle mounds, as well as a set of late 18<sup>th</sup> century bridge abutments. In certain rare circumstances, the activities called for in the WFMP could result in disturbance or injury to these resources and other resources eligible for listing. Therefore, impacts to cultural resources will be addressed as an impact topic in this environmental assessment.

**Water Resources (Water Quality, Wetlands, and Floodplains):** National Park Service policies require protection of water quality consistent with the mandates of the Clean Water Act, including the provisions of Section 404 of the Act governing wetlands. Executive Order 11990, *Protection of Wetlands*, requires federal agencies to avoid, where possible, adversely impacting wetlands. Similarly, Executive Order 11988, *Floodplain Management*, requires all federal agencies to avoid construction within the 100-year floodplain unless no other practicable alternatives exist. Proposed actions that have the potential to have an adverse effect on wetlands and certain construction activities in the 100-year floodplain must be addressed in a Statement of Findings.

Suppression and other activities in the proposed action could result in impacts to some sensitive aquatic resources. Therefore, water resources will be addressed as an impact topic in this environmental assessment.

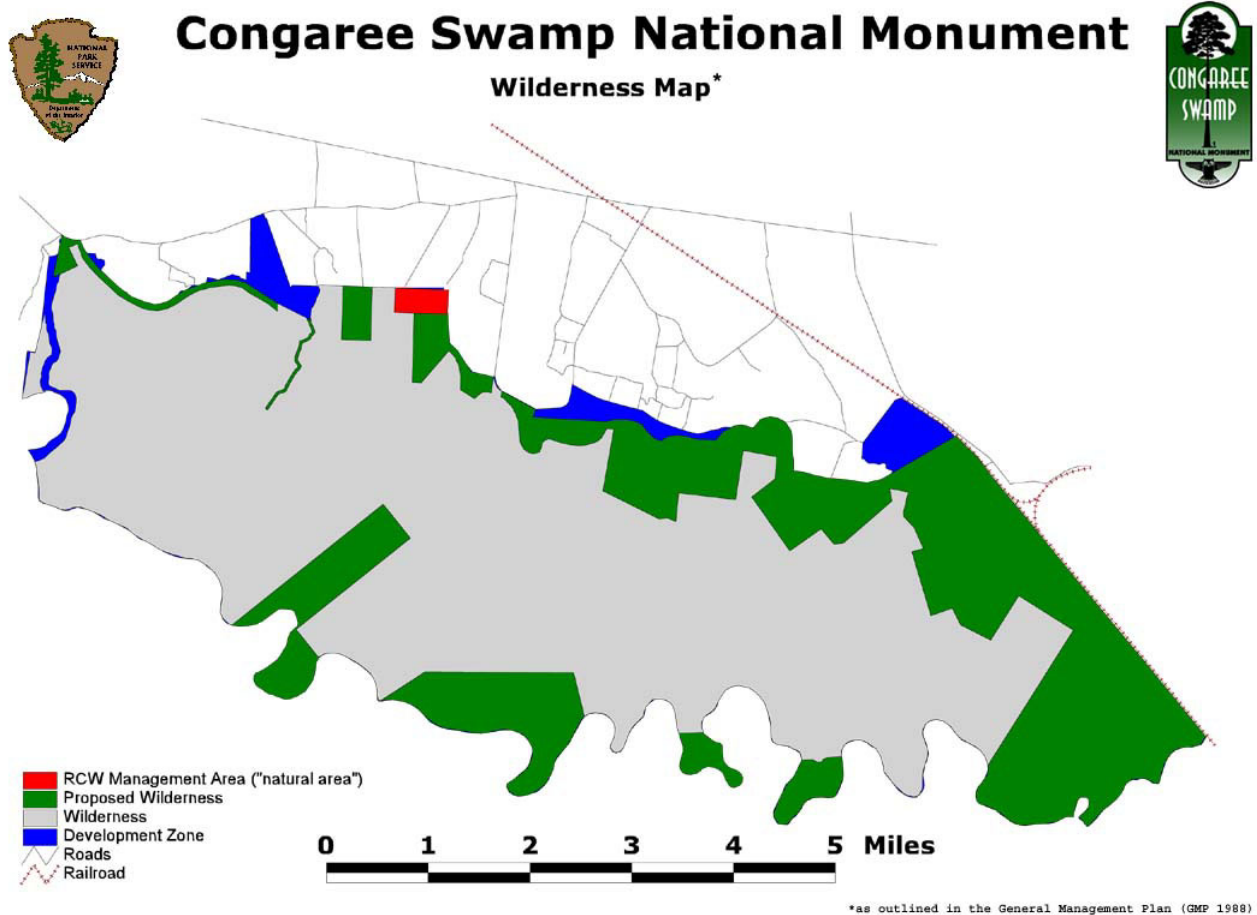
**Wilderness:** Approximately 98.4% of the federally-owned land at Congaree Swamp National Monument has been designated wilderness or potential wilderness by Congress. The Wilderness Act directs the National Park Service to protect and manage wilderness so that it “generally appears to have been affected primarily by the forces of nature, with the imprint of man’s work substantially unnoticeable,” and so that it “has outstanding opportunities for solitude, or a primitive and unconfined type of recreation.” As a general rule, vehicular travel and mechanized equipment is prohibited in congressionally designated wilderness areas.

The proposed action would authorize, in certain limited circumstances, the use of motor vehicles and mechanized equipment in wilderness and potential wilderness. Therefore, wilderness will be addressed as an impact topic. Reference is made to Figure 4, a map of designated wilderness and potential wilderness at COSW.

**Public Health and Safety:** Successful implementation of the proposed action could enhance public safety by decreasing the risk of a wildland fire. However, carrying out a prescribed fire program involves certain inherent risks that the prescribed fire might escape and cause injury and property damage. In addition, smoke from prescribed fire can affect some persons prone to respiratory illnesses. Therefore, public health and safety will be addressed as an impact topic.

**Visitor Use and Experience:** Congaree Swamp National Monument is open every day of the year except December 25. Over the past decade, visitation to the Monument has increased from less than 50,000 to over 100,000 people per year. Because certain activities in the WFMP could affect the experiences of some visitors to the Monument, visitor use and experience will be addressed as an impact topic in this environmental assessment.

Figure 4: Congaree Swamp National Monument Wilderness Areas.



**Monument Operations:** Congaree Swamp National Monument has a relatively large land base in relation to its small permanent staff. Wildland fire and fuel management activities can affect Monument operations, either directly via the threat to facilities from approaching fires, or indirectly through smoke effects and the diversion of personnel to firefighting and management of prescribed fires. More generally, implementing the WFMP would affect resource management, visitor services, and maintenance responsibilities of Monument staff. Therefore, Monument operations will be addressed as an impact topic in this environmental assessment.

## 2.2: Impact Topics Dismissed from Further Analysis

**Geology and Topography:** The National Park Service's *Management Policies* (2001) require the protection of significant geologic and topographic features. Under the WFMP, the existing topography of the Monument would not change. Because there would be no impacts to geological features and the topography of the ground would be unchanged, geology and topography were dismissed as impact topics.

**Prime and Unique Farmland:** In August, 1980, the Council on Environmental Quality (CEQ) directed that Federal agencies must assess the effects of their actions on farmland soils classified by the U.S. Department of Agriculture's Natural Resource Conservation Service as prime or unique. Prime or unique farmland is defined as soil that particularly produces specialty crops such as fruits, vegetables, and nuts. No qualifying soils exist within Congaree Swamp National Monument. Therefore, prime and unique farmland was dismissed as an impact topic.

**Socioeconomic environment:** Implementation of the proposed action could have generalized beneficial effects on neighboring communities by decreasing the risk of fire and attendant destruction of property as well as reducing smoke during natural and arson type fire events. On the other hand, prescribed fire events could result in some smoke impacts of limited duration and infrequent occurrence throughout the year. Prior to any scheduled burning, all park neighbors in the vicinity of the burn area are notified so that any concerns that they might have can be addressed. Taken together, these beneficial and adverse impacts would likely have no effect on the area's overall population, income and employment base. Therefore, the socioeconomic environment was dismissed as an impact topic.

**Environmental Justice:** According to the Environmental Protection Agency, environmental justice is the fair treatment and meaningful involvement of all people, regardless of race, color, national origin, or income, with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies. Fair treatment means that no group of people, including a racial, ethnic, or socioeconomic group, should bear a disproportionate share of the negative environmental consequences resulting from industrial, municipal, and commercial operations or the execution of federal, state, local, and tribal programs and policies.

Presidential Executive Order 12898, "General Actions to Address Environmental Justice in Minority Populations and Low-Income Populations," requires all federal agencies to incorporate environmental justice into their missions by identifying and addressing the disproportionately high and/or adverse human health or environmental effects of their programs and policies on minorities and low-income populations and communities. The proposed action would not have health or environmental effects on minorities or low-income populations or communities as defined in the Environmental Protection Agency's Draft Environmental Justice Guidance (July 1996). Therefore, environmental justice was dismissed as an impact topic.

**Noise:** Noise is defined as unwanted sound. Fuels reduction, prescribed fires and fire suppression efforts can all involve the use of noise-generating mechanical tools and devices with engines, such as chain saws and trucks. Chain saws, at close range, are quite loud (in excess of 100 decibels). The use of machines, such as chainsaws, would be infrequent in light of the limited thinning to be conducted on the park (on the order of hours, days, or at most weeks per year). This is not frequent enough to substantially interfere with human activities in the area or with wildlife behavior. Nor will such infrequent bursts of noise chronically impair the solitude and tranquility associated

with the park. Therefore, this impact topic is eliminated from further analysis in this EA.

**Waste Management:** None of the FMP alternatives would generate noteworthy quantities of either hazardous or solid wastes that need to be disposed of in hazardous waste or general sanitary landfills. Therefore this impact topic is dropped from additional consideration.

**Utilities:** Generally speaking, some kinds of projects, especially those involving construction, may temporarily impact above and below-ground telephone, electrical, natural gas, water, and sewer lines and cables, potentially disrupting service to customers. Other proposed actions may exert a substantial, long-term demand on telephone, electrical, natural gas, water, and sewage infrastructure, sources, and service, thereby compromising existing service levels or causing a need for new facilities to be constructed. None of the FMP alternatives will cause any of these effects to any extent, and therefore utilities are eliminated from any additional analysis.

**Land Use:** Visitor and administrative facilities occur within the park. Fire management activities would not affect land uses within the park or in areas adjacent to it; therefore, land use is not included for further analysis in this EA.

**Transportation:** None of the FMP alternatives would substantively affect road, railroad, water based, or aerial transportation in and around the park. One exception to this general rule would be the temporary closure of nearby roads during fire suppression activities or from smoke emanating from wildland fires or prescribed fires. Over the long term, such closures would not significantly impinge on local traffic since they would be both very infrequent, and, in the case of prescribed fire, of short duration (on the magnitude of 1-4 hours). Therefore, this topic is dismissed from any further analysis.

**Indian Trust Resources:** Indian trust assets are owned by Native Americans but held in trust by the United States. Indian trust assets do not occur within Congaree Swamp National Monument and therefore are not evaluated further in this EA.

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### 3.0: ALTERNATIVES, INCLUDING THE PROPOSED ACTION

The National Park Service has evaluated a range of alternatives governing wildland fire management at Congaree Swamp National Monument. Alternatives selected for full analysis must meet the objectives of the park to a large degree, while also meeting the purpose and need for action. Three alternatives are described in this section, along with two alternatives that were considered but eliminated from further consideration.

#### Elements Common to All Alternatives:

1. Suppression actions will be taken on all human and natural caused wildland fires. Under Alternative A - Combined Fire Program / No-Action (Preferred Alternative), suppression actions will utilize either a confine, contain, or control strategy as delineated in Table 2. Under Alternative B (Full Suppression), and Alternative C (Prescribed Fire Only), suppression actions would be limited to a control strategy. Suppression actions would always provide for public and firefighter safety, the protection of public and private resources, and utilization of techniques that are least damaging to the Monument's natural and cultural resources.

**Table 2 - Suppression Response Strategies**

|                |  |
|----------------|--|
| <b>CONFINE</b> | To restrict a wildland fire within predetermined boundaries, established either prior to, or during the fire. These identified boundaries will contain the fire, with no suppression action being taken on the ground until the fire is out. |
| <b>CONTAIN</b> | To restrict a wildland fire to a defined area, using a combination of natural and constructed barriers that will stop the spread of the fire under the prevailing and forecasted weather conditions, until out.                              |
| <b>CONTROL</b> | A wildland fire aggressively fought through the skillful use of personnel, equipment, and aircraft to establish fire-lines around a fire, to halt the spread, and to extinguish all hot spots until out.                                     |

2. Wildland fire use, the use of natural fires to benefit the resource, would not be allowed under any of the alternatives. "Human caused wildland fires" does not include prescribed fire, UNLESS the prescribed fire goes beyond the management prescription and is declared an escaped wildland fire.
3. Mechanical treatment, including thinning of trees, may be used to reduce fuel loads utilizing the use of labor and/or mechanical equipment to reduce fuel accumulations for protection of property, reduction of potential wildland fire conflagration, and meeting resource management objectives. Environmental impacts from hazard fuel management and mitigation are discussed in section 5.0 of this assessment.
4. Suppression responses would be selected by the Monument Fire Management Officer or acting Park Fire Coordinator commensurate with the Monument's

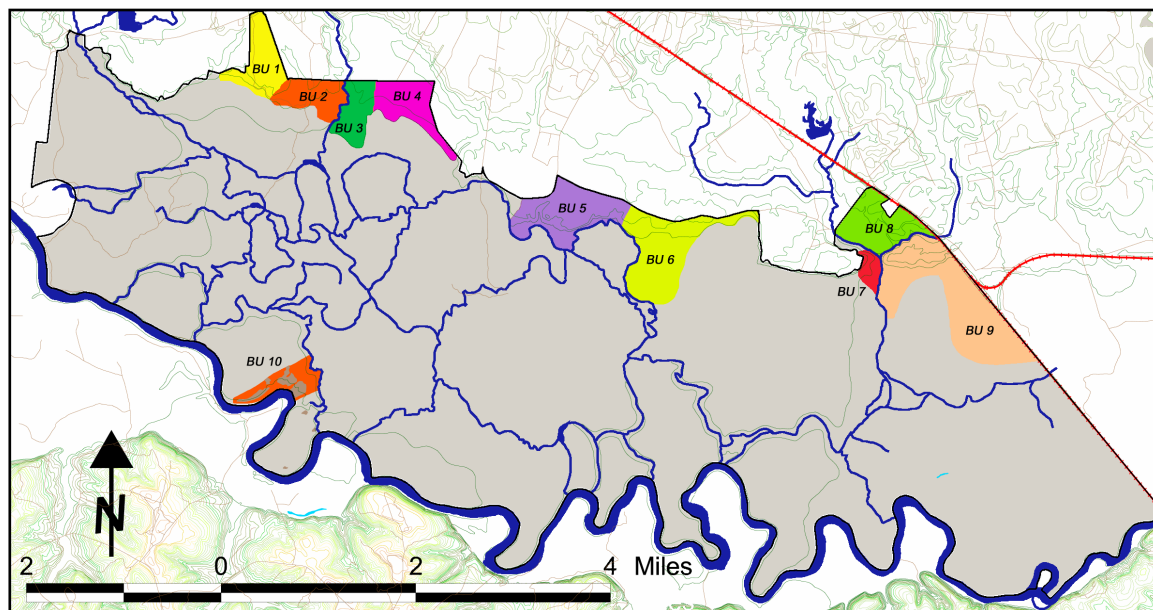
mandate for the protection of life and property, the maintenance of the natural resource, and the preservation of wilderness resources and values.

5. Where prescribed fire is addressed in any of the alternatives, reference is made to Table 3 and Figure 5 for potential burn locations and proposed years of action that are addressed within this EA. It is not the intent of this EA, or the associated Wildland Fire Management Plan (WFMP) to allow prescribed burning haphazardly throughout the entire Monument. Effectively, over the next five years (through the year 2008), there will be no prescribed burning south of Cedar Creek or Running Lake. This leaves most of the known cultural landscape features out of the scope of this EA in so far as management ignited prescribed fire is concerned. The following alternatives were analyzed for this environmental assessment.

**Table 3 - 5-Year Schedule of Prescribed Burning**

| <b>Fiscal Year</b> | <b>Burn Unit (s)</b> | <b>Treatment Area*</b> | <b># of Acres</b> | <b>Season of Burning</b> |
|--------------------|----------------------|------------------------|-------------------|--------------------------|
| 2003               | 5                    | Dawson Area            | 190               | Spring                   |
| 2004               | 1,2,3,& 4            | VC Area                | 575               | Spring                   |
| 2005               | 5                    | Dawson Area            | 190               | Spring                   |
| 2006               | 1,2,3,& 4            | VC Area                | 575               | Fall/Winter              |
| 2007               | 5 & 6                | Dawson Area            | 380               | Spring                   |
| 2008               | 7 & 8                | Griffins Creek Area    | 170               | Spring                   |

**Figure 5: Congaree Swamp National Monument - Burn Unit Map**



### **3.1: *Alternative A - Combined Fire Program / No-Action (Preferred Alternative)***

Under the guidelines of the National Environmental Policy Act of 1969 (NEPA), and the Council on Environmental Quality (CEQ) Regulations (40 CFR 1500-1508), a "No-Action" alternative "may be thought of in terms of continuing with the present course of action until that action is changed." The "No-Action" alternative for the Monument would therefore be a continuation of a combined fire program.

Under this alternative elements of Alternatives B and C would be integrated into the Monument's Fire Management Plan. All unplanned human-caused ignitions would be suppressed using one of the three suppression strategies of confinement, containment, or control, as appropriate to fire location and type. Prescribed fire would be utilized under appropriate conditions to assist in hazard fuel reduction, wildlife habitat improvement, reinstitution of historic fire regimes, exotic species control and to fulfill other resource management objectives. Additionally, wildland fire use for resource benefit (Alternative D) would be further researched for possible implementation, in the future, in the designated wilderness areas of the Monument.

### **3.2: *Alternative B - Full Suppression***

Under this alternative, all fires, regardless of cause, would be suppressed through direct attack utilizing a control strategy. There would be no management ignited prescribed fire allowed. Hazard fuel reduction may be completed with the use of labor and mechanical equipment only. Full suppression does not eliminate the potential for excessive resource impact and large conflagration fires. High intensity fires could still burn in such a manner that suppression effort could only attempt to reduce the negative impacts until burning conditions would allow for effective suppression. Additionally, as unburned fuels built up over time the potential for higher intensity fires could increase due to the enhanced fuel load. Additionally, fire dependent ecosystems would be severely retarded due to the continued lack of fire in the woodlands.

### **3.3: *Alternative C - Prescribed Fire Only***

Under this alternative, prescribed fire would be utilized to accomplish resource management goals of restoring the natural pattern of fire within the Monument's ecosystem. Like other types of disturbances, e.g., hurricanes, droughts, floods, etc..., fire is a natural part of the evolution of biotic communities. Prescribed fire would also be used to accomplish hazard fuel management, along with labor and mechanical equipment, as appropriate. Prescribed fire would reduce the risks to the Monument's natural and cultural resources and adjacent private property, should a wildland fire occur. Additionally, prescribed fire would be used to carry out other management objectives such as exotic species control and wildlife habitat enhancement. All other ignitions would be suppressed through direct attack utilizing a control strategy regardless of cause or location.

### **3.4: *Alternative D – Wildland Fire Use for Resource Benefit Only***

Under this alternative, naturally occurring fires, such as those caused by lightning, would be allowed to burn in portions of the Monument under predetermined conditions

that are favorable to the management of the fire. Predetermined conditions or prescriptions refer to very specific parameters that include wind speed and direction, temperature, relative humidity, fuel moisture and maximum allowable burn area. All of these parameters have well defined acceptable ranges that may not be exceeded and are carefully monitored in order for a naturally occurring fire to be allowed to progress. If a wildland fire used for resource benefit were to exceed these parameters it would be reclassified as an escaped wildland fire and suppressed. All other fires would be suppressed and prescribed fire would not be utilized. This alternative is not a viable option at the Monument at this time due to the lack of enough onsite fire personnel, proximity to urban interface and commercial timberland area, and lack of fire history documentation in the floodplain area (FMU 4). This option is not discussed in the WFMP and is a subject for future research and implementation. As such this alternative is no longer considered.

### **3.5: *Alternative E - Abandonment of Fire Management***

Under this alternative, all fires, regardless of cause, would be allowed to burn with no effort to suppress or mitigate the fire impacts. This alternative fails to meet Agency policy and responsibility and raises the potential for losses of life and property, as well as unacceptable resource impacts. This alternative was summarily rejected and is no longer considered.

### **3.6: *Impact Mitigation for the Proposed Action***

#### **3.6.1: Protection of Wilderness Resources**

All suppression activities and all mechanical or prescribed wildland fire actions will be subject to a minimum requirements determination to ascertain whether the action is necessary and appropriate in wilderness or potential wilderness. If the action is both necessary and appropriate to protect wilderness resources and values, the action will be further analyzed to determine the minimum tool necessary to accomplish the objectives of the proposed action. Whenever possible, the Monument will use minimum impact suppression tactics to minimize or prevent damage to wilderness. For a more complete discussion of minimum impact suppression tactics, see Appendix A of this environmental assessment.

#### **3.6.2: Protection of Rare or Endangered Species**

Species adversely impacted by fire and listed as rare, threatened or endangered would be protected from wildland fire or prescribed wildland fire. Whenever possible, minimum impact suppression tactics will be used to prevent habitat or species destruction (see Appendix A). Monitoring and inventorying of burn unit areas will be completed prior to burning to identify any potential impacts to rare, threatened or endangered species.

#### **3.6.3: Hazard Fuels Management**

Resources that could be negatively affected by mechanical or prescribed wildland fire actions will be protected to the fullest extent possible. Monitoring and inventorying of hazard fuel reduction sites will be completed prior to fuel management activities to

identify any potential impacts to rare, threatened, endangered or otherwise sensitive species or resources.

#### **3.6.4: Air Quality and Smoke Management**

Suppression and prescribed wildland fire management actions will comply with the "Smoke Management Guidelines" of South Carolina and in accordance with all-applicable policy guidelines, laws and regulations. Prescribed wildland fire plans will include smoke mitigation constraints.

#### **3.6.5: Water Resources (Water Quality, Wetlands, Floodplains)**

During fire suppression, no fire retardant will be used in the floodplain under any circumstances. Elsewhere in the Monument, water will be used in lieu of fire retardant whenever possible. If fire retardant must be used, a non-fugitive type will be chosen, and bodies of water will be avoided. Stream crossings will be limited to set and existing locations. Following fire suppression activities, fire lines will be re-contoured, water barred, and seeded with native plant species where appropriate and as necessary.

#### **3.6.6: Visitor Use; Human Health and Safety**

Regardless of the fire type, wildland fire or prescribed wildland fire, all sites upon which a fire event is occurring will be closed to the public and appropriate enforcement controls put in place. If portions of the Monument are safe for use during fire events, visitors will be directed to those areas. Park neighbors and local residents will be notified of any fire management events that have the potential to impact them. Smoke on roadways will be monitored and traffic control provisions will be taken to ensure motorist safety during fire events at the park.

#### **3.6.7: Suppression Tactics**

Minimum impact suppression tactics will be used to the fullest extent possible to prevent unwarranted resource damage. Rehabilitation of fire-lines or other constructions will be done at the earliest possible time permitted by the extent and behavior of the fire.

### **3.7: *Environmentally Preferred Alternative***

The environmentally preferred alternative is determined by applying criteria set forth in NEPA, as guided by direction from the Council on Environmental Quality (CEQ). The CEQ has stated that the environmentally preferred alternative is the alternative that will promote the national environmental policy as expressed in NEPA, Section 101. This includes alternatives that:

- Fulfill the responsibilities of each generation as trustee of the environment for succeeding generations;
- Assure for all generations safe, healthful, productive, and esthetically and culturally pleasing surroundings;
- Attain the widest range of beneficial uses of the environment without degradation, risk of health or safety, or other undesirable and unintended consequences;

- Preserve important historic, cultural, and natural aspects of our national heritage and maintain, wherever possible, an environment that supports diversity and variety of individual choice;
- Achieve a balance between population and resource use that will permit high standards of living and a wide sharing of life's amenities; and
- Enhance the quality of renewable resources and approach the maximum attainable recycling of depletable resources.

The NPS has determined that the environmentally preferable alternative is Alternative A (Preferred Alternative) because it surpasses the other action alternatives in realizing the fullest range of national environmental policy goals as stated above. Alternative A would:

- Reduce fuel loadings to a level that would mimic the behavior of natural, fire-adapted conditions, and enhance the protection of resources for succeeding generations.
- Improve the safety, healthfulness, and esthetics of the surroundings.
- Reduce risks to health and safety and other undesirable consequences of wildland fire.
- Restore dominance of fire-adapted plant communities.
- Provide better protection of natural and cultural resources.

To a greater extent than the other alternatives, Alternative A would reduce the risk of wildland fire while protecting and restoring Monument resources and values. Alternative A would allow for a gradual landscape transition to what would have been normal historically by promoting the use of prescribed fire to reduce fuel loads and mimic historic fire regimes. Alternative A would also allow for the quick suppression of human caused arson and dangerous natural fires that could cause safety concerns or instill drastic changes to the landscape too quickly to be taken advantage of by the ecosystem. Therefore, Alternative A is the environmentally preferred alternative.

#### **4.0: AFFECTED ENVIRONMENT**

Congaree Swamp National Monument is a prime and relatively undisturbed example of a mature Cypress-Gum and bottomland hardwood forest complex and the largest contiguous stand of old-growth southern bottomland forest in the eastern United States.

The authorized boundary of the Monument occupies 22,200 acres along the north side of the Congaree River in southeast Richland County, South Carolina, and approximately 20 miles southeast of the Capitol City of Columbia.

Although traditionally referred to as "the swamp," the Monument is actually an alluvial floodplain of the Congaree River. As documented by Glenn G. Patterson, Gary K. Speiran and Benjamin H. Whetstone in their study of the Hydrology and its effects on Distribution of Vegetation in Congaree Swamp National Monument, South Carolina (1985), only 10% of the Monument's area contains permanent surface water, with the remaining 90% of the landscape being forested. The floodplain, having an elevation change of only 10 feet within a 13-mile range, contains a wealth of varied and complex vegetative communities. These vegetative communities are a result of slight topographic gradients that, when combined with the sedimentation of the old river channels, create an assortment of succession changes within the forest.

The hydrological cycle of the Monument is the driving force behind the unique ecosystem that is being preserved. The Congaree River watershed consists of over 8,000 square miles of land extending into North Carolina. These lands are drained by the Broad and Saluda rivers, which converge to form the Congaree River. Additional tributaries include Cedar Creek, which enters the Monument from the northwest. The Monument undergoes flooding events historically approximately 10 times a year, inundating as much as 90% of the site at least once a year.

##### **4.1: Climate**

The climate at the Monument is temperate, characterized by warm, humid summers and mild winters with average monthly temperatures ranging from 46° to 81° Fahrenheit. Spring is the most variable time of the year with the passage of occasional cold fronts in March to a generally warm and pleasant May. Average annual rainfall is about 47 inches with the average monthly rainfall varying from seasonal lows in November of roughly 2.5 inches, to highs of 5.5 inches in August. Long summers are the norm and hot and humid weather usually lasts from May to September with temperatures ranging from 80° to 100° Fahrenheit during the days and relative humidity often above 85% during this period.

##### **4.2: Air Quality**

The Monument was classified as a Class II clean air area under the 1977 amendments to the Clean Air Act (42 U.S.C. 7401 et seq.). Under Class II, modest increases in air pollution are allowed beyond baseline levels for sulfur dioxide and particulate matter, provided that the National Ambient Air Quality Standards, established by the Environmental Protection Agency, are not exceeded.

#### **4.3: Geology & Soils**

The soils in the Monument comprise rich, fine textured alluviums extending in places to depths of 10 feet or more. Immediately adjacent to the streams in the Monument, the soils are primarily loams of the Congaree and Chewacla series. Near the low northern bluffs, the soils change over to Tawcaw silty clay. Throughout the floodplain there are spots of Chastain silt loam, Toccooa loam, and Dorovan muck, which is a peat. All of these soils are poorly drained with slow runoff and permeability. The upland areas of the low northern bluffs contain primarily Persanti fine sandy loams that are moderately well drained with medium runoff and slow permeability. Additionally, Cantey loams and Smithboro silt loams that are poorly drained with slow to very slow runoff and permeability are also found on the low northern bluffs.

#### **4.4: Forest Types**

The Monument comprises 22,200 acres, of which about 90% of the area, or roughly 20,000 acres, is primarily a floodplain with a variety of swamp and bottomland hardwood stands of diverging types. The remaining 10% of the Monument, or approximately 2,200 acres, contain areas of upland timber types located on and above the low northern bluffs. The most common forest types are:

Southern Bottomland Hardwoods - located between the low northern bluffs and the Congaree River. This type most commonly includes Cypress, Cottonwood, Green Ash, Red Maple, Laurel Oak, Sweetgum, Swamp Tupelo, Swamp Chestnut Oak, Overcup Oak and Willow Oak, among others. These can be found in both solitary as well as mixed stands with differing degrees of dominance. The majority of this area can be classified as either Sweetgum/Mixed Hardwood type or Laurel Oak/Sweetgum type. The understory consists primarily of Dwarf Palmetto, Paw Paw, Ironwood, Possum Haw, and saplings of the associated species.

Loblolly Pine - located primarily on the low northern bluffs and extending in spots within the floodplain. This type contains some of the largest Loblolly pine forest in the country, with heights up to 168' and circumferences to 15.5'. Loblollies within the floodplain, mixed with the bottomland hardwoods are an uncommon forest association. Some disruptions of the forest succession in years past enabled the loblollies to become established. Although scientifically unproven, a study done by Pederson et al, speculated that fire, farming and/or hurricanes may have been the disturbances responsible for allowing the Loblolly pine to become established within the floodplain.

Pine Plantations - This type is characterized by even-aged stands of 15 to 30 year old Loblolly pine that have been planted or have taken over cleared areas. Located on the north bluffs of the floodplain, these stands were established by prior landowners and acquired as part of the 1988 authorized boundary expansion.

Upland Hardwoods - Common to the well drained soil sites (Tawcaw silty clay and Persanti fine sandy loams) of the floodplain ridges and bluffs, this type consists of a mixture of Oaks and Hickories along with Sycamore, Beech, and Sugarberry.



Overall, most of the vegetative communities delineated within the Monument are variations or successional stages of the above listed types. Also identified are a number of state listed plant species of concern that exist within the Monument. These species have been verified and include:

- |                          |                            |
|--------------------------|----------------------------|
| • Botrychium lunarioides | white grapefern            |
| • Carex cherokeensis     | Cherokee sedge             |
| • Carex crus-corvi       | ravenfoot sedge            |
| • Carex socialis         | social sedge               |
| • Cayaponia quinqueloba  | fivelobe cucumber          |
| • Collinsonia serotina   | Walter's whorled horsebalm |
| • Dryopteris carthusiana | spinulose woodfern         |
| • Macbridea caroliniana  | Carolina birds-in-a-nest   |
| • Urtica chamaedryoides  | weak nettle                |

#### **4.5: Archeological Resources**

The meandering of the Congaree River throughout time has probably destroyed many cultural resources as evidenced not only by cultural materials that occur on sandbars, but also by a mosaic of oxbow lakes in various stages of eutrophication. The environment of the floodplain, with its low-lying, frequently flooded and damp nature is of the type that would tend to discourage human utilization. What occupation that did occur was most likely in the form of limited activities such as the extraction of specific flora and fauna for subsistence, minimal cultivation of the rich soils, and the employment of browse and mast to raise livestock. Despite the harsh conditions of the Monument, and perhaps in some cases because of it, several historic and archeological sites have been identified.

The archeological sites relative to the prehistoric period are limited in number and scope. As documented by James Michie in his Cultural Resource Study and Archeological Survey (1980), at least half of these sites are spurious in deposition and resulted from imported soils used to fill and maintain roads prior to the establishment of the Monument. There were also attempts at building roads and a bridge through the floodplain, along with attempts at flood control through the use of dikes to facilitate cultivation. Additionally, a number of elevated earthen structures, probably cattle mounts, provided refuge for livestock during floods. All of these attempts to harness the floodplain resources were relatively small in scope and of short duration. Due to the subterranean or "earthen" nature of these resources fire management should have little, if any, impact on them.

#### **4.6: Wildlife**

The Monument provides some of South Carolina's most exceptional wildlife habitat. High fall mast production and a variety of vegetative cover provide sources of food and ample nesting and resting sites. A large variety of wildlife inhabits the Monument's grounds, including, but not limited to:

- |                     |                      |                  |
|---------------------|----------------------|------------------|
| ➤ <i>Wood Ducks</i> | ➤ <i>Owls</i>        | ➤ <i>Fox</i>     |
| ➤ <i>Egrets</i>     | ➤ <i>Turkeys</i>     | ➤ <i>Bobcat</i>  |
| ➤ <i>Hérons</i>     | ➤ <i>Doves</i>       | ➤ <i>Bats</i>    |
| ➤ <i>Kestrels</i>   | ➤ <i>Woodpeckers</i> | ➤ <i>Muskrat</i> |
| ➤ <i>Hawks</i>      | ➤ <i>Rabbits</i>     | ➤ <i>Deer</i>    |

The principal limiting factor of wildlife inhabitation in the Monument is the periodic inundation of floodwaters throughout the year.

Reptiles and amphibians are also plentiful, primarily due to the wet environment, Aquatic fauna such as crayfish, clams and snails of multiple varieties proliferate throughout the floodplain.

The Congaree River is the primary fishery of the area. On the floodplain, Cedar Creek, Toms Creek and some of the oxbow lakes harbor game fish and non-game fish species such as Large-mouth Bass, Blue Gills, Crappie, Perch, Gar, Shiners and Minnows. Additionally, Stripped Bass are found in the Congaree River. All are considered native species.

The red-cockaded woodpecker, an endangered species, recently occupied a small portion of the Monument on the low northern bluffs. Although the habitat required for endangered species such as the ivory-billed woodpecker and the eastern cougar exists within the Monument, no verifiable sightings have occurred in the Monument.

The Monument is also home to feral hogs, feral dogs, and feral cats. These exotic animals compete with the native species for food and present a possible threat to the Monument's native wildlife.

## **5.0: ENVIRONMENTAL IMPACTS OF THE ALTERNATIVES**

### **5.1: *Introduction***

The National Environmental Policy Act requires that federal agencies, before taking an action, discuss the environmental impacts of that action, feasible alternatives to that action, and any adverse environmental effects that cannot be avoided if the proposed action is implemented. This section of the EA describes the potential environmental impacts of implementing each of the alternatives (i.e., the no-action alternative and the four action alternatives) on natural and cultural resources, visitor use and experience, the socioeconomic environment, and Monument operations. These impacts provide a basis for comparing the advantages and disadvantages of the four action alternatives.

This analysis of environmental consequences consists largely of a qualitative assessment of the effects of the three alternatives with respect to 10 impact topics. The first part of this section discusses the methodology used to identify impacts and includes definitions of terms. The impact topics are then analyzed with reference to each of the three alternatives. The discussion of each impact topic includes a description of the positive and negative effects of the alternatives, a discussion of cumulative effects, if any, and a conclusion. The conclusion includes a discussion of whether, and to what extent, the alternative would impair park resources and values. For the analyses, NPS considered the mitigation measures described in section 5.0 of this assessment.

### **5.2: *Methodology***

Generally, the methodology for resource impact assessments follows direction provided in the Council on Environmental Quality (CEQ) Regulations for Implementing the National Environmental Policy Act, Parts 1502 and 1508. The impact analysis and the conclusions in this part are based largely on the review of existing literature and park studies, information provided by experts within the National Park Service and other agencies, park staff insights and professional judgement.

The impacts from the three alternatives were evaluated in terms of the context, duration, and intensity of the impacts, as defined below, and whether the impacts were considered beneficial or adverse to park resources and values.

#### **5.2.1: Context**

Each impact topic addresses effects on resources inside and outside the Monument; to the extent those effects are traceable to the actions set forth in the alternatives.

#### **5.2.2: Duration and Intensity of Impacts**

Impacts are analyzed in terms of their intensity (negligible, minor, moderate, or major) and duration (short- or long-term). The criteria used to define the duration and intensity of impacts associated with the analysis is presented in Table 4.

**Table 4 - Impact Threshold Definitions**

| Impact Topic  | Impact Threshold Definition   |   |   |   | Duration  |
|---|---|---|---|---|---|
|   | Negligible  | Minor   | Moderate  | Major   |   |
| <b>Air quality</b>  | No changes would occur or changes in air quality would be below or at the level of detection, and if detected, would have effects that would be considered slight and short-term.   | Changes in air quality would be measurable, although the changes would be small, short-term, and the effects would be localized. No air quality mitigation measures would be necessary.   | Changes in air quality would be measurable, would have consequences, although the effect would be relatively local. Air quality mitigation measures would be necessary and the measures would likely be successful.   | Changes in air quality would be measurable, would have substantial consequences, and be noticed regionally. Air quality mitigation measures would be necessary and the success of the measures could not be guaranteed.   | Short Term- Recovers in 7 days or less<br><br>Long Term- Takes more than 7 days to recover  |
| <b>Endangered or threatened species and critical habitats</b> | No federally listed species would be affected or the alternative would affect an individual of a listed species or its critical habitat, but the change would be so small that it would not be of any measurable or perceptible consequence to the protected individual or its population. Negligible effect would equate with a "no effect" determination in U.S. Fish and Wildlife Service terms. | The alternative would affect an individual(s) of a listed species or its critical habitat, but the change would be small and would be short-term. Minor effect would equate with a "may effect" determination in U.S. Fish and Wildlife Service terms and would be accompanied by a statement of "likely..." or "not likely to adversely affect" the species. | An individual or population of a listed species, or its critical habitat would be noticeably affected. The effect would have some long-term consequence to the individual, population, or habitat. Moderate effect would equate with a "may effect" determination in U.S. Fish and Wildlife Service terms and would be accompanied by a statement of "likely..." or "not likely to adversely affect" the species. | An individual or population of a listed species, or its critical habitat, would be noticeably affected with a long-term, vital consequence to the individual, population, or habitat. Major effect would equate with a "may effect" determination in U.S. Fish and Wildlife Service terms and would be accompanied by a statement of "likely..." or "not likely to adversely affect" the species or critical habitat. | Plants<br><br>Short Term- Recovers in less than 1 year<br><br>Long Term- Takes more than 1 year to recover<br><br>Animals<br><br>Short Term- Recovers in less than 1 year<br><br>Long Term- Takes more than 1 year to recover |

| Impact Topic      | Impact Threshold Definition   |  |  |  | Duration   |
|-------------------|---|--|--|--|--|
|                   | Negligible  | Minor  | Moderate   | Major  |  |
| <b>Soil</b>       | Soils would not be affected or the effects to soils would be below or at the lower levels of detection. Any effects to soil productivity or fertility would be slight and no long-term effects to soils would occur.  | The effects to soils would be detectable, but likely short-term. Effects to soil productivity or fertility would be small, as would the area affected. If mitigation were needed to offset adverse effects, it would be relatively simple to implement and likely successful.                                  | The effect on soil productivity or fertility would be readily apparent, long-term, and result in a change to the soil character over a relatively wide area. Mitigation measures would probably be necessary to offset adverse effects and would likely be successful.   | The effect on soil productivity or fertility would be readily apparent, long-term, and substantially change the character of the soils over a large area in and out of the park. Mitigation measures to offset adverse effects would be needed, extensive, and their success could not be guaranteed.                                    | Short Term- Recovers in less than 3 years<br>Long Term- Takes more than 3 years to recover |
| <b>Vegetation</b> | No native vegetation would be affected or some individual native plants could be affected as a result of the alternative, but there would be no effect on native species populations. The effects would be short-term, on a small scale, and no species of special concern would be affected. | The alternative would temporarily affect some individual native plants and would also affect a relatively minor portion of that species' population. Mitigation to offset adverse effects, including special measures to avoid affecting species of special concern, could be required and would be effective. | The alternative would affect some individual native plants and would also affect a sizeable segment of the species' population in the long-term and over a relatively large area. Mitigation to offset adverse effects could be extensive, but would likely be successful. Some species of special concern could also be affected. | The alternative would have a considerable long-term effect on native plant populations, including species of special concern, and affect a relatively large area in and out of the park. Mitigation measures to offset the adverse effects would be required, extensive, and success of the mitigation measures would not be guaranteed. | Short Term- Recovers in less than 3 years<br>Long Term- Takes more than 3 years to recover |

| Impact Topic    | Impact Threshold Definition |   |   |  | Duration  |   |
|-----------------|-----------------------------|---|---|--|---|---|
|                 | Negligible                  | Minor   | Moderate  | Major  |   |   |
| Water resources | Water Quality - Hydrology   | Neither water quality nor hydrology would be affected, or changes would be either non-detectable or if detected, would have effects that would be considered slight, local, and short-term.   | Changes in water quality or hydrology would be measurable, although the changes would be small, likely short-term, and the effects would be localized. No mitigation measure associated with water quality or hydrology would be necessary.                         | Changes in water quality or hydrology would be measurable and long-term but would be relatively local. Mitigation measures associated with water quality or hydrology would be necessary and the measures would likely succeed.  | Changes in water quality or hydrology would be readily measurable, would have substantial consequences, and would be noticed on a regional scale. Mitigation measures would be necessary and their success would not be guaranteed.   | Short Term-<br>Following treatment recovery will take less than one year<br><br>Long Term-<br>Following treatment recovery will take longer than one year |
|                 | Wetlands - Floodplains      | Wetlands or floodplains would not be affected or the effects to the resource would be below or at the lower levels of detection. No long-term effects to wetlands or floodplains would occur and any detectable effects would be slight. No U.S. Army Corps of Engineers 404 permit would be necessary. | The effects to wetlands or floodplains would be detectable and relatively small in terms of area and the nature of the change. A U.S. Army Corps of Engineers 404 permit would not be required. No long-term effects to wetlands or floodplains would likely occur. | The alternative would result in effects to wetlands or floodplains that would be readily apparent, including a long-term effect on wetland vegetation, such that an U.S. Army Corps of Engineers 404 permit could be required. Wetland or floodplain functions would not be affected in the long-term. | Effects to wetlands or floodplains would be observable over a relatively large area, would be long-term, and would require a U.S. Army Corps of Engineers 404 permit. The character of the wetland or floodplain would be changed so that the functions typically provided by the wetland or floodplain would be substantially changed. | Short Term-<br>Recovers in less than 1 year<br><br>Long Term-<br>Takes more than 1 year to recover  |

| Impact Topic              | Impact Threshold Definition   |   |  |   | Duration  |
|---------------------------|---|---|--|---|---|
|                           | Negligible  | Minor   | Moderate   | Major   |   |
| <b>Wildlife</b>           | Wildlife would not be affected or the effects would be at or below the level of detection, would be short-term, and the changes would be so slight that they would not be of any measurable or perceptible consequence to the wildlife species' population. | Effects to wildlife would be detectable, although the effects would be localized, and would be small and of little consequence to the species' population. Mitigation measures, if needed to offset adverse effects, would be simple and successful.  | Effects to wildlife would be readily detectable, long-term and localized, with consequences at the population level. Mitigation measures, if needed to offset adverse effects, would be extensive and likely successful.   | Effects to wildlife would be obvious, long-term, and would have substantial consequences to wildlife populations in the region. Extensive mitigation measures would be needed to offset any adverse effects and their success would not be guaranteed.  | Short Term- Recovers in less than 1 year<br><br>Long Term- Takes more than 1 year to recover  |
| <b>Cultural Resources</b> | The impact is at the lowest levels of detection – barely perceptible and not measurable.  | For archeological resources, the impact affects an archeological site(s) with modest data potential and no significant ties to a living community' s cultural identity. The impact does not affect the character defining features of a National Register of Historic Places eligible or listed structure, district, or cultural landscape. | For archeological resources, the impact affects an archeological site(s) with high data potential and no significant ties to a living community' s cultural identity. For a National Register eligible or listed structure, district, or cultural landscape, the impact changes a character defining feature(s) of the resource but does not diminish the integrity of the resource to the extent that its National Register eligibility is jeopardized. | For archeological resources, the impact affects an archeological site(s) with exceptional data potential or that has significant ties to a living community' s cultural identity. For a National Register eligible or listed structure, district, or cultural landscape, the impact changes a character defining feature(s) of the resource, diminishing the integrity of the resource to the extent that it is no longer eligible to be listed in the National Register. | Short term- Treatment effects on the natural elements of a cultural landscape may be comparatively short-term (e.g., three to five years until new vegetation grows or historic plantings are restored, etc.)<br><br>Long term- Because most cultural resources are non-renewable, any effects on archaeological, historic, or ethnographic resources, and on most elements of a cultural landscape would be long term. |

| Impact Topic               | Impact Threshold Definition   |   |   |  | Duration  |
|----------------------------|---|---|---|--|---|
|                            | Negligible  | Minor   | Moderate  | Major  |   |
| <b>Wilderness</b>          | No effects would occur or the effects to wilderness conditions would be below or at the level of detection. The effect would be slight and no long-term effects to wilderness conditions would occur. | The effects to wilderness conditions would be detectable. Any effects would be small and if mitigation is needed to offset potential adverse effects, it would be successful.   | The effects to wilderness conditions would be readily apparent and likely long-term. Any effects would result in changes to wilderness conditions on a local scale. If mitigation is needed to offset potential adverse effects, it could be extensive, but would likely be successful. | The effects to wilderness conditions would be readily apparent, long-term, and would cause substantial changes to wilderness conditions in the region. Mitigation measures to offset potential adverse effects would be extensive and their success could not be guaranteed.   | Short Term- Recovers in less than 5 years<br>Long Term- Takes more than 5 years to recover  |
| <b>Monument Operations</b> | Park operations would not be affected or the effect would be at or below the lower levels of detection, and would not have an appreciable effect on park operations.                                  | The effect would be detectable and likely short-term, but would be of a magnitude that would not have an appreciable effect on park operations. If mitigation were needed to offset adverse effects, it would be relatively simple and likely successful. | The effects would be readily apparent, be long-term, and would result in a substantial change in park operations in a manner noticeable to staff and the public. Mitigation measures would probably be necessary to offset adverse effects and would likely be successful.              | The effects would be readily apparent, long-term, would result in a substantial change in park operations in a manner noticeable to staff and the public and be markedly different from existing operations. Mitigation measures to offset adverse effects would be needed, would be extensive, and their success could not be guaranteed. | Short term- effects lasting for the duration of the treatment action.<br>Long term- effects lasting longer than the duration of the treatment action. |



| Impact Topic                      | Impact Threshold Definition  |   |  |  | Duration  |
|-----------------------------------|--|---|--|--|---|
|                                   | Negligible   | Minor   | Moderate   | Major  |   |
| <b>Public health and safety</b>   | Public health and safety would not be affected, or the effects would be at low levels of detection and would not have an appreciable effect on the public health or safety.  | The effect would be detectable and short-term, but would not have an appreciable effect on public health and safety. If mitigation were needed, it would be relatively simple and likely successful.                                  | The effects would be readily apparent and long-term, and would result in substantial, noticeable effects to public health and safety on a local scale. Mitigation measures would probably be necessary and would likely be successful. | The effects would be readily apparent and long-term, and would result in substantial, noticeable effects to public health and safety on a regional scale. Extensive mitigation measures would be needed, and their success would not be guaranteed.  | Short term- Effects lasting for the duration of the treatment action.<br><br>Long term- Effects lasting longer than the duration of the treatment action. |
| <b>Visitor use and experience</b> | Visitors would not be affected or changes in visitor use and/or experience would be below or at the level of detection. Any effects would be short-term. The visitor would not likely be aware of the effects associated with the alternative. | Changes in visitor use and/or experience would be detectable, although the changes would be slight and likely short-term. The visitor would be aware of the effects associated with the alternative, but the effects would be slight. | Changes in visitor use and/or experience would be readily apparent and likely long-term. The visitor would be aware of the effects associated with the alternative and would likely be able to express an opinion about the changes.   | Changes in visitor use and/or experience would be readily apparent and have important long-term consequences. The visitor would be aware of the effects associated with the alternative and would likely express a strong opinion about the changes. | Short Term- occurs only during the treatment effect.<br><br>Long Term- occurs after the treatment effect.   |

### 5.2.3: Impact Type

Unless otherwise noted, impacts would be adverse.

CEQ regulations and the National Park Service's Conservation Planning, Environmental Impact Analysis and Decision-making (Director's Order #12) call for a discussion of the appropriateness of mitigation, as well as an analysis of how effective the mitigation would be in reducing the intensity of a potential impact, e.g. reducing the intensity of an impact from major to moderate or minor. The preferred alternative assumes that Monument managers would apply mitigation measures to minimize or avoid impacts. If appropriate mitigation measures were not applied, the potential for resource impacts would increase and the magnitude of those impacts would rise.

#### **5.2.4: Direct versus Indirect Impacts**

Direct effects would be caused by an action and would occur at the same time and place as the action. Indirect effects would be caused by the action and would be reasonably foreseeable but would occur later in time, at another place, or to another resource.

#### **5.3: *Cumulative Impacts***

Regulations implementing NEPA issued by the CEQ require the assessment of cumulative impacts in the decision-making process for federal actions. Cumulative impacts are defined as "the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions" (40 CFR 1508.7). Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time.

The cumulative impacts analyzed in this document consider the incremental effects of the three alternatives in conjunction with past, current, and future actions at the Monument. Cumulative impacts were determined by combining the effects of a given alternative with other past, present, and reasonably foreseeable future actions. The impact analysis and conclusions are based on information available in the literature, data from NPS studies and records, and information provided by experts within the National Park Service and other agencies. Unless otherwise stated, all impacts are assumed to be direct and long-term.

#### **5.4: *Impairment of National Monument Resources or Values***

In addition to determining the environmental consequences of the preferred and other alternatives, the 2001 NPS *Management Policies* and Director's Order 12 require analysis of potential effects to determine if actions would impair Monument resources or values.

The fundamental purpose of the National Park System, established by the Organic Act and reaffirmed by the General Authorities Act, as amended, is to conserve the resources and values of each unit of the system. Although Congress has given NPS management discretion to allow certain impacts within individual units, that discretion is limited by statutory requirement that the NPS must leave resources and values unimpaired, unless a particular law directly and specifically provides otherwise. The prohibited impairment is an impact that, in the professional judgement of the responsible NPS manager, would harm the integrity of unit resources or values, including opportunities that otherwise would be present for the enjoyment of those resources or values. Impairment may result from NPS activities or inaction in managing the unit, visitor activities, or activities undertaken by concessionaires, contractors, and others operating in the unit.

To determine whether actions and management prescriptions involving Monument resources would result in impairment, each alternative was evaluated to determine if it

had a major adverse effect on a resource or value whose conservation is:

- **Necessary** to fulfill specific purposes identified in the establishing legislation of the Monument;
- **Key** to the natural or cultural integrity of the Monument or to opportunities for enjoyment of the Monument; or
- **Identified** as a goal within the General Management Plan and/or other relevant NPS planning documents.

### **5.5: Soils**

#### **Alternative A - Combined Fire Program / No-Action (Preferred Alternative)**

**Analysis:** The short-term direct effects of this alternative are related to mechanical fuels reduction activities, slash-pile burning, and the use of prescribed fire. Thinning and limbing activities would have negligible to minor, short-term, localized, direct adverse effects on soils. Access to work sites, dragging of slash and downed timber would create negligible to minor soil disturbance and compaction. Because the treatment areas have low slopes, there would be little change in erosion.

Dispersal of slash and chipping and distributing activities would have minimal effects on soil resources. Decomposition rates are rapid in this humid environment, and nutrients would be released quickly into the soil. The burning of slash piles could produce temperatures hot enough to kill regenerative plant tissues in the soils immediately under the burn area (Anderson 1996), however the effects would be negligible because these areas would be quite small, and seed sources would be readily available from nearby plants. The nutrients in the ash could increase the fertility of the soils under the burns (Bauder 2000).

Low-intensity, prescribed fire would have negligible to minor, beneficial impacts on soil fertility (Bauder 2000). This would occur directly as minerals and nutrients are released during combustion, and indirectly by increasing decomposition rates. Low-intensity fires over the long term provide regenerative processes for soil and vegetation in the southern pineland ecosystem (Chandler et al, 1991). The reduction of fuel loading and creation of a defensible zone or firebreak across the Monument would create long-term beneficial effects to soils, as the potential for severe wildland fire would be reduced.

In the floodplain, impacts on soil in the form of erosion, sterilization, or disturbance associated with fire suppression would be minimal. The majority of the floodplain soils retain high moisture content throughout the year due to the frequency of flooding events.

**Cumulative Impacts:** Historic land use in the Congaree Swamp area included agriculture on many areas of the low northern bluff. In the short-term, the activities of thinning and slash-pile burning would contribute negligibly to the impacts that these past activities impacts have had on soil resources in the Monument. Some adjacent

landowners (Plum Creek Timberlands, LP) are pursuing fuel load reduction strategies through a policy of active timber management. Their efforts, in concert with the proposed actions at Congaree Swamp National Monument, would serve to protect local soil resources from the effects of wildland fire and large-scale fire suppression. These benefits are long-term, negligible to moderate, and local to regional in scale. The short-term, negligible, adverse effects associated with treatment activities would be more than offset as high fuel loads and the risk of wildland fire are reduced.

**Conclusion:** Actions undertaken during implementation of Alternative A would produce short-term, negligible to minor, highly localized effects on soils within the treatment areas. Adverse effects, associated primarily with pile or “jackpot” burning would be offset by the long-term, negligible to minor beneficial effects from prescribed fire.

Because there would be no major, adverse impacts to a resource or value the conservation of which is (1) necessary to fulfill specific purposes identified in the enabling legislation of Congaree Swamp National Monument; (2) key to the natural or cultural integrity of the Monument; or (3) identified as a goal in the Monument’s General Management Plan or other relevant National Park Service planning documents, there would be no impairment of the Monument’s resources or values.

## **Alternative B – Full Suppression**

**Analysis:** The short-term direct effects of this alternative are related to mechanical fuels reduction activities. Thinning and limbing activities would have negligible to minor, short-term, localized, direct adverse effects on soils. Access to work sites, dragging of slash and downed timber would create negligible to minor soil disturbance and compaction. Because the treatment areas have low slopes, there would be little change in erosion.

Dispersal of slash and chipping and distributing activities would have minimal effects on soil resources. Decomposition rates are rapid in this humid environment, and nutrients would be released quickly into the soil.

Direct and intensive full scale suppression actions constitute a short to long term impact to soils in the form of increased compaction by fire vehicles and scrapping of the ground to create defensible fire-line. Without a fuel reduction strategy, fuels could accumulate to levels that could burn with higher intensity and, similar to slash pile burning, could produce temperatures hot enough to kill regenerative plant tissues in the soils immediately under the burn area (Anderson, 1996). This could primarily occur in the areas of the low northern bluffs and would be unlikely to affect the lower floodplain areas due to higher soil moistures.

**Cumulative Impacts:** Historic land use in the Congaree Swamp area included agriculture on many areas of the low northern bluff. In the short-term, the thinning and limbing activities would contribute negligibly to the impacts that these past activities impacts have had on soil resources in the Monument. Fuel loads could increase over

time under the policy of full suppression resulting in higher potentially damaging soil temperatures during fire events.

**Conclusion:** Actions undertaken during implementation of Alternative B would produce short-term, negligible to minor, highly localized effects on soils within the mechanical treatment areas. Adverse effects, associated primarily with increased suppression actions and higher potential fire danger in the low northern bluff areas of the Monument could produce short-term, minor effects on soils.

Because there would be no major, adverse impacts to a resource or value the conservation of which is (1) necessary to fulfill specific purposes identified in the enabling legislation of Congaree Swamp National Monument; (2) key to the natural or cultural integrity of the Monument; or (3) identified as a goal in the Monument's General Management Plan or other relevant National Park Service planning documents, there would be no impairment of the Monument's resources or values.

### **Alternative C – Prescribed Fire Only**

**Analysis:** Mechanical and prescribed fire use would be the same as in Alternative A. Full containment on all other wildland fires would have the same negative effect as Alternative "B".

**Cumulative Impacts:** Same as Alternative A.

**Conclusion:** Actions undertaken during implementation of Alternative C would produce short-term, negligible to minor, highly localized effects on soils within the treatment areas. Adverse effects, associated with pile or "jackpot" burning would be offset by the long-term, negligible to minor beneficial effects from prescribed fire. Additional adverse effects would be associated with increased suppression actions. These actions could produce short to long-term, minor effects on soils through increased soil compaction by fire vehicles and scrapping of the ground to create defensible fire-line.

Because there would be no major, adverse impacts to a resource or value the conservation of which is (1) necessary to fulfill specific purposes identified in the enabling legislation of Congaree Swamp National Monument; (2) key to the natural or cultural integrity of the Monument; or (3) identified as a goal in the Monument's General Management Plan or other relevant National Park Service planning documents, there would be no impairment of the Monument's resources or values.

## **5.6: Vegetation**

### **Alternative A - Combined Fire Program / No-Action (Preferred Alternative)**

**Analysis:** The short-term direct effects of this alternative are related to mechanical fuels reduction activities, slash-pile burning, and the use of prescribed fire. Thinning and limbing activities would have negligible to minor, short-term, localized, direct adverse effects on vegetation. Access to work sites, dragging of slash and downed

timber would create negligible to minor vegetation disturbance. This alternative would allow the Monument to suppress wildland fires and protect resources that would be negatively impacted from fire. Prescribed fire would allow the Monument to reduce hazard fuel accumulations under conditions that would allow for effective yet safe management. Impacts and consequences on vegetative communities and other resources would be determined scientifically through monitoring and inventory practices done prior to and after prescribed fires. More knowledge of fire and its effects in the floodplain would be gleaned so as to possibly introduce wildland fire use for resource benefit into the Monument's fire management program.

In vegetation types that have been impacted by fire suppression, fire would be reintroduced to return the site(s) to more natural historic fire regimes. In addition, prescribed fire could be useful in the control of exotic and invasive plant species. However, while fire may help control some invasive and exotic plant species, many exotics (such as Japanese honeysuckle and privet) are disturbance-adapted and fire increases their vigor and facilitates their spread.

**Cumulative Impacts:** Historic land use in the Congaree Swamp area included agriculture on many areas of the low northern bluff. In the short-term, the activities of thinning and slash-pile burning would contribute negligibly to the impacts that these past activities have had on vegetation types in the Monument. In some instances, prescribed fire could facilitate the spread of invasive plant species first introduced by past land use practices.

Under the preferred alternative, vegetation would experience short-term disturbance due to thinning activities and slash pile burning. However prescribed burning could reverse the long-term impacts associated with suppression and return historically known native species to the area.

**Conclusion:** Actions undertaken during implementation of Alternative A would produce negligible to minor, short-term, localized, direct adverse effects on vegetation within the treatment areas. Alternative A would authorize the use of the “confine” or “contain” strategies during suppression activities in addition to direct control. As a result, this alternative would result in less use of mechanized equipment in the wilderness and fewer physical impacts to vegetation. Adverse effects, associated primarily with mechanical fuel reduction and dragging of slash and downed timber, would be offset by the reintroduction of fire in vegetation types that have been impacted by past fire suppression. Reintroduction of prescribed fire and management of wildland fire through a range of suppression techniques would have long-term, minor to moderate, beneficial effects on vegetation. Impacts would be more beneficial under Alternative A than under the other alternatives because use of the “confine” or “contain” strategies would allow a more natural fire regime, with corresponding benefits for vegetation. Should fire result in the spread of fire-adapted exotic species, impacts would be minor to moderate, long-term, and adverse.

Because there would be no major, adverse impacts to a resource or value the conservation of which is (1) necessary to fulfill specific purposes identified in the enabling legislation of Congaree Swamp National Monument; (2) key to the natural or cultural integrity of the Monument; or (3) identified as a goal in the Monument's General Management Plan or other relevant National Park Service planning documents, there would be no impairment of the Monument's resources or values.

### **Alternative B - Full Suppression**

**Analysis:** This alternative would continue the unnatural succession patterns of some vegetative communities through the hindrance or elimination of historic fire regimes within the Monument. Specifically, the natural continuation of some of the pines within the floodplain may be affected along with a reduction of the pine stands on and above the low northern bluffs through an increase in hardwood succession and a decline in natural pine regeneration. Hazard fuel reduction would need to be accomplished through labor and mechanical means alone and they may not be entirely effective, resulting in possible conflagration and increased intensity of fire incidents. Additionally, increased suppression impacts from potentially larger tactical operations could result in adverse resource impacts.

**Cumulative Impacts:** Historic land use in the Congaree Swamp area included agriculture on many areas of the low northern bluff. In the short-term, thinning would contribute negligibly to the impacts that these past activities impacts have had on vegetation types in the Monument.

Under this alternative, however, vegetation would experience long-term disturbance due to the elimination of larger low-impact fires that favor the historically present native species. Impacts associated with full suppression include the suppression activities on vegetation as well as the long term vegetative condition change that would occur.

**Conclusion:** Under a program of full suppression, impacts to vegetation would be moderate to major, long-term, and adverse.

This alternative would result in major, adverse impacts to a resource or value the conservation of which is (1) necessary to fulfill specific purposes identified in the enabling legislation of Congaree Swamp National Monument; (2) key to the natural or cultural integrity of the Monument; or (3) identified as a goal in the Monument's General Management Plan or other relevant National Park Service planning documents. Accordingly, this alternative would result in impairment of the Monument's resources or values.

### **Alternative C - Prescribed Fire Only**

**Analysis:** The use of this alternative would allow the restoration of a more natural fire regime thus permitting more natural vegetative community succession. Prescribed fire results in closer adherence to natural processes than full suppression and is integral in

bringing fire to areas where the natural biotic community requires it to maintain its ecological character and integrity. In addition, prescribed fire can be useful in the control of exotic and invasive plant species. However, while fire may help control some invasive and exotic plant species, many (such as Japanese honeysuckle and privet) are disturbance-adapted and fire increases their vigor and facilitates their spread.

Timing of prescribed fire is the most important factor limiting the beneficial effects of fire. By timing fires to coincide with weather and fuel conditions that would be favorable for management of the fire, some natural environmental effects such as stand replacement may not be allowed to occur. Full containment on all other wildland fires would have the same negative effect as Alternative "B".

**Cumulative Impacts:** Same as Alternative A.

**Conclusion:** The reintroduction of fire in vegetation types that have been impacted by past fire suppression would have long-term, minor to moderate, beneficial effects on vegetation. Overall, the long-term beneficial impacts of Alternative C would be less than those of Alternative A because Alternative C would not allow use of the "confine" or "contain" strategies during suppression activities, with the result that the beneficial effects of fire would extend to a smaller vegetated area. To the extent that the prescribed fire program failed to achieve periodic stand-replacing fires, the result could be long-term, negligible to minor, adverse effects on vegetation. In addition, should fire result in the spread of fire-adapted exotic species, impacts would be minor to moderate, long-term, and adverse.

Because there would be no major, adverse impacts to a resource or value the conservation of which is (1) necessary to fulfill specific purposes identified in the enabling legislation of Congaree Swamp National Monument; (2) key to the natural or cultural integrity of the Monument; or (3) identified as a goal in the Monument's General Management Plan or other relevant National Park Service planning documents, there would be no impairment of the Monument's resources or values.

### **5.7: Wildlife & Special Status Species**

#### **Alternative A - Combined Fire Program / No- Action (Preferred Alternative)**

**Analysis:** Under this alternative, fire regimes within the Monument would be brought back in line with historical occurrence through the use of prescribed wildland fire for hazard fuel reduction and wildlife habitat enhancement. Although the primary use of prescribed wildland fire would be on or above the low northern bluffs, the possibility of use in the floodplain exists in the future. In certain carefully selected areas within the floodplain of the Monument, this would result in a more natural vegetative community and habitat type for wildlife. Endangered species habitat could be manipulated to provide for recovery and enhancement. Wildland fires would be suppressed for the protection of sensitive species and habitat. Fire ecology and effects would continue to be studied to assist in maintaining the optimum management of wildlife and wildlife



habitat. Additionally, knowledge would be gained that might allow wildland fire use for resource benefit in future Monument fire management planning.

**Cumulative Impacts:** Historic land use in the Congaree Swamp area included agriculture on many areas of the low northern bluff. In the short-term, the activities of thinning and slash-pile burning would contribute negligibly to the impacts that these past activities impacts have had on wildlife and special status species within the Monument.

Under the preferred alternative, wildlife and special status species could experience short-term habitat disturbance due to thinning activities and slash pile burning. However, a long term strategy of prescribed burning to emulate natural fire could reverse the long-term impacts to habitats associated with suppression and return the area to more historically normal habitat types.

**Conclusion:** The reintroduction of more natural fire regimes in vegetation types that have been impacted by past fire suppression would have long-term, minor to moderate, beneficial effects on most wildlife and special status species. In some instances, habitat manipulation through mechanical fuel reduction could result in improved habitat, resulting in long-term, minor to moderate, beneficial effects on some types of wildlife and special status species. For species needing less open habitats, prescribed fire and mechanical fuel reduction could result in long-term, minor to moderate, adverse effects. Some species could experience negligible to minor, short-term, adverse impacts to habitat due to thinning activities and slash pile burning.

Because there would be no major, adverse impacts to a resource or value the conservation of which is (1) necessary to fulfill specific purposes identified in the enabling legislation of Congaree Swamp National Monument; (2) key to the natural or cultural integrity of the Monument; or (3) identified as a goal in the Monument's General Management Plan or other relevant National Park Service planning documents, there would be no impairment of the Monument's resources or values.

### **Alternative B - Full Suppression**

**Analysis:** Wildlife populations and habitat areas would be influenced indirectly through the unnatural long term impacts on the vegetative community types. Those species that are dependent on ecosystems influenced by fire may decline and species more tolerant of the resulting ecosystem may be introduced and/or proliferate. Increased suppression activities from potentially larger tactical operations could inadvertently result in the destruction of wildlife and/or wildlife habitat, disrupting the resident populations.

**Cumulative Impacts:** Historic land use in the Congaree Swamp area included agriculture on many areas of the low northern bluff. In the short-term, the activities of thinning would contribute negligibly to the impacts that these past activities impacts have had on wildlife and special status species in the Monument.

Under this alternative however, wildlife and special status species habitat dependent on the historical conditions would experience long-term disturbance due to the elimination of larger low impact fires occurring that favor natural and normal habitats. Impacts associated with full suppression include the suppression activities directly to habitat as well as the long term wildlife and special status species habitat condition change that would occur.

**Conclusion:** Under a program of full suppression, impacts to vegetation would be moderate to major, long-term, and adverse.

This alternative would result in moderate to major, adverse impacts to a resource or value the conservation of which is (1) necessary to fulfill specific purposes identified in the enabling legislation of Congaree Swamp National Monument; (2) key to the natural or cultural integrity of the Monument; or (3) identified as a goal in the Monument's General Management Plan or other relevant National Park Service planning documents. Accordingly, this alternative would result in impairment of the Monument's resources or values.

### **Alternative C - Prescribed Fire Only**

**Analysis:** Under this alternative, conditions favorable to wildlife and special status species dependent on ecosystems influenced by fire would be produced; however exact natural conditions could not be attained. Through the use of prescribed wildland fire, management could simulate the natural distributions of fire and its effects on wildlife habitat. Additionally, prescribed wildland fire would allow for the manipulation of habitat to induce conditions favorable for specific endangered species such as the red-cockaded woodpecker. In contrast to Alternative A, wildland fire would be suppressed using a "control" strategy, rather than "confine" or "contain."

**Cumulative Impacts:** Same as Alternative A.

**Conclusion:** The reintroduction of fire in vegetation types that have been impacted by past fire suppression would have long-term, minor to moderate, beneficial effects on most wildlife and special status species. However, the use of direct full suppression on wildland fires, the lack of mechanical fuel reduction, and the failure to undertake additional scientific research would have long-term, minor to moderate, adverse effects on some types of wildlife and special status species.

Because there would be no major, adverse impacts to a resource or value the conservation of which is (1) necessary to fulfill specific purposes identified in the enabling legislation of Congaree Swamp National Monument; (2) key to the natural or cultural integrity of the Monument; or (3) identified as a goal in the Monument's General Management Plan or other relevant National Park Service planning documents, there would be no impairment of the Monument's resources or values.

***Statement regarding consultation under section 7 of the Endangered Species Act:***

After applying the relevant criteria from the Endangered Species Act, the National Park Service concludes that implementation of the preferred alternative is not likely to adversely affect any federally-listed threatened or endangered species. Formal consultation will be requested with the U.S. Fish and Wildlife Service under Section 7 of the Endangered Species Act.

**5.8: Air Quality**

**Alternative A - Combined Fire Program / No Action (Preferred Alternative)**

**Analysis:** Under this alternative, impacts to air quality would be the greatest. Due to the use of prescribed wildland fire, along with the occurrence of wildland fire events, a larger more integral use of fire in management actions would be considered. Emissions from individual fire events, however, would be temporary and minimized. Prescribed wildland fires would be planned events and conditions would be utilized that would lessen the magnitude and duration of fire emissions on the surrounding air-shed. Wildland fire events would be responded to under a strategy of control, contain, or confine which could allow longer duration wildland events than direct full suppression.

For prescribed fire, there are three principle strategies to manage smoke and reduce impacts to air quality. They are:

- Avoidance – This strategy relies on monitoring meteorological conditions when scheduling prescribed fires to prevent smoke from drifting into sensitive receptors, or suspending burning until favorable weather (wind) conditions;
- Dilution – This strategy ensures proper smoke dispersion in smoke-sensitive areas by controlling the rate of smoke emissions or scheduling prescribed fires when weather systems are unstable, not under conditions when a stable high-pressure area is forming with an associated subsidence inversion. An inversion would trap smoke near the ground; and
- Emission Reduction – This strategy utilizes techniques to minimize smoke output per unit area treated. Smoke emission is affected by the number of acres burned at one time, pre-burn fuel loadings, fuel consumption, and the emission factor. Reducing the number of acres that are burned at one time would reduce the amount of emissions generated by that burn. Reducing fuel beforehand, e.g., by removing firewood, reduces the amount of fuel available. Conducting prescribed burns when fuel moistures are high can reduce fuel consumption. Emission factors can be reduced by pile burning or by using certain firing techniques such as mass ignition.

There are several “sensitive receptors” (e.g., private residences) in the vicinity of the park that may be susceptible to smoke impacts from a prescribed fire. If weather conditions changed unexpectedly during a prescribed fire, and there was a potential for violating air quality standards or for adverse smoke impacts on these sensitive receptors the park would implement a contingency plan, including the option of

immediate suppression. Considering the number of acres that would be affected by prescribed fire in any given year (200 to 700 acres) and considering that the major fuel types to be consumed (trees, shrubs) can generate relatively large quantities of smoke, prescribed fires could conceivably violate daily national or state emission standards and could cause short-term, minor to moderate impacts to air quality. The greatest threat to air quality would be smoke impacts to sensitive receptors; however, the park would only conduct prescribed fires under environmental conditions that maximized smoke dispersion.

**Cumulative Impacts:** The frequency and typical duration of fire events in the Monument are few and sporadic. Due to the stratification of the woodland along with a large area of urban interface, fire events tend to be small and of short duration. Effects on the air shed also tend to be small and of short duration. In the long term there is little, if any, cumulative effects that would be equal to or greater than the historical averages that were caused by natural fire events.

**Conclusion:** Under Alternative A, impacts to air quality resulting from fire events would be short term, minor to moderate, and adverse.

Because there would be no major, adverse impacts to a resource or value the conservation of which is (1) necessary to fulfill specific purposes identified in the enabling legislation of Congaree Swamp National Monument; (2) key to the natural or cultural integrity of the Monument; or (3) identified as a goal in the Monument's General Management Plan or other relevant National Park Service planning documents, there would be no impairment of the Monument's resources or values.

## **Alternative B - Full Suppression**

**Analysis:** Under this alternative the amount of particulate matter emitted from fire would probably be lower in the near term due to the elimination of the use of prescribed wildland fire and full suppression control actions. However, the potential for more severe episodes of particulate matter emission in singular episodes exists as a result of the potential buildup of fuels that could result in large uncontrollable fires.

**Cumulative Impacts:** Same as Alternative A.

**Conclusion:** Under this alternative, impacts to air quality resulting from wildland fire would be short term, moderate to major, and adverse.

Because there would be no major, adverse impacts to a resource or value the conservation of which is (1) necessary to fulfill specific purposes identified in the enabling legislation of Congaree Swamp National Monument; (2) key to the natural or cultural integrity of the Monument; or (3) identified as a goal in the Monument's General Management Plan or other relevant National Park Service planning documents, there would be no impairment of the Monument's resources or values.

## **Alternative C - Prescribed Fire Only**

**Analysis:** This alternative would likely result in a high level of emitted particulate over time. The ability, however, to schedule prescribed wildland fire under optimum fuel and atmospheric conditions would succeed in the promotion of higher levels of air quality during fire events. Overall, impacts from smoke would be the same as in Alternative A. Additionally, the severity of wildland fires would be offset due to the reduction of wildland fire acreage and intensity from fuel reduction through the use of prescribed wildland fire.

**Cumulative Impacts:** Same as Alternative A.

**Conclusion:** Under this alternative, impacts to air quality resulting from fire events would be short term, minor to moderate, and adverse.

Because there would be no major, adverse impacts to a resource or value the conservation of which is (1) necessary to fulfill specific purposes identified in the enabling legislation of Congaree Swamp National Monument; (2) key to the natural or cultural integrity of the Monument; or (3) identified as a goal in the Monument's General Management Plan or other relevant National Park Service planning documents, there would be no impairment of the Monument's resources or values.

### **5.9: Cultural Resources**

#### **Alternative A - Combined Fire Program / No Action (Preferred Alternative)**

**Analysis:** Under this alternative, impacts to known cultural resources would be minimized. The advance planning and protection of known cultural resources, where they exist within prescribed burn units, would be included in the prescribed wildland fire burn plan. Advance planning would include consultation with cultural managers regarding the location and extent of fire-lines. Mitigation on surrounding sites that could be sensitive to fire would be done in conjunction with cultural resource managers to ensure their effectiveness. This may include ringing a site with a light fire-line surface scrape or setting up sprinklers to ensure fire does not enter the cultural site during prescribed fire events. All known prehistoric and listed structures such as cattle mounds, prehistoric mounds, slave quarters, wooden raft, and wooden bridge pilings, are located out of the area under consideration for prescribed burning. The only known structures within any of the prescribed burn units are old whisky stills; mitigation with the cultural resource manager on-site will be done prior to burning in those areas. Use of prescribed fire will result in reduced fuel loading and lower intensity fires under controlled conditions. These benefits along with minimum impact suppression tactics (see Appendix A) would further reduce the potential for damage to known and unknown cultural resources within prescribed burn units. Wildland fire suppression tactics would continue to be the greatest threat to resources. During unplanned wildland fire events every effort will be taken to protect known cultural resources.

**Cumulative Impacts:** As cultural resources are nonrenewable, damage or loss from any cause would gradually diminish the types and numbers of resources available for study or visitor enjoyment. When impacts of the preferred alternative, including protection of resources and reduction of fuel loads, are combined with other past, present and future activities and processes affecting cultural resources, The effects would be minor due to the limited scope of cultural resources found at the Monument.

**Conclusion:** The planning and scouting of sites for prescribed fire operations could lead to the discovery and protection of cultural sites, resulting in minor, long-term, beneficial impacts to cultural resources. Suppression activities during wildland fire events could result in minor to moderate, long-term and adverse impacts to cultural resources.

Because there would be no major, adverse impacts to a resource or value the conservation of which is (1) necessary to fulfill specific purposes identified in the enabling legislation of Congaree Swamp National Monument; (2) key to the natural or cultural integrity of the Monument; or (3) identified as a goal in the Monument's General Management Plan or other relevant National Park Service planning documents, there would be no impairment of the Monument's resources or values.

## **Alternative B - Full Suppression**

**Analysis:** Under this alternative, known archeological resources would receive protection from wildland fire events. Known resources at the Monument are primarily earthen structures and subterranean sites that are unlikely to be damaged by fire. Suppression tactics and activities would constitute the primary danger to cultural resources. Unknown cultural resources may be sensitive to fire or damaged through suppression actions.

**Cumulative Impacts:** In the past, fire suppression in the Monument did nothing to reduce fuel loads and in fact fuel loads have continued to increase. Over time a buildup of these fuels can contribute to cumulative losses of cultural resources from wildland fires over a broad area inside and outside the Monument. As cultural resources are nonrenewable, damage or loss from any cause would gradually diminish the types and numbers of resources available for study or visitor enjoyment. Protection of cultural resources under this alternative would rely heavily on existing archeological surveys as the only fire events responded to would be unplanned.

**Conclusion:** Direct suppression activities (control strategy) during wildland fire events could result in minor to moderate, long-term and adverse impacts to cultural resources.

Because there would be no major, adverse impacts to a resource or value the conservation of which is (1) necessary to fulfill specific purposes identified in the enabling legislation of Congaree Swamp National Monument; (2) key to the natural or cultural integrity of the Monument; or (3) identified as a goal in the Monument's General

Management Plan or other relevant National Park Service planning documents, there would be no impairment of the Monument's resources or values.

### **Alternative C - Prescribed Fire Only**

**Analysis:** This alternative would protect known archeological resources through planning and implementation of prescribed wildland fire. Minimum impact suppression tactics and planning of prescribed wildland fires would reduce the potential for damage to unknown cultural resources.

**Cumulative Impacts:** Same as Alternative A.

**Conclusion:** The planning and scouting of sites for prescribed fire operations could lead to the discovery and protection of cultural sites, resulting in minor, long-term, beneficial impacts to cultural resources. Suppression activities during wildland fire events could result in minor to moderate, long-term and adverse impacts to cultural resources.

Because there would be no major, adverse impacts to a resource or value the conservation of which is (1) necessary to fulfill specific purposes identified in the enabling legislation of Congaree Swamp National Monument; (2) key to the natural or cultural integrity of the Monument; or (3) identified as a goal in the Monument's General Management Plan or other relevant National Park Service planning documents, there would be no impairment of the Monument's resources or values.

### **5.10: Water Resources (Water Quality, Wetlands, Floodplains)**

#### **Alternative A - Combined Fire Program / No Action (Preferred Alternative)**

**Analysis:** Under this alternative, short-term effects of fires can include addition of sediment to streams which would increase in response to frequency or magnitude of precipitation events and extent of de-vegetation in burned areas (Christensen et al 1989), increased channel erosion in stream sections where riparian vegetation has burned (Hansen 1990), and increased stream temperatures resulting from loss of forest canopy (Helvey et al. 1976). Impacts to water quality from prescribed burning would be controlled through the planning of prescribed wildland fire, and the protection of sensitive aquatic areas. The effects on water resources as a result of unplanned wildland fire events would be further mitigated through the use of prescribed fire to reduce hazard fuels in some areas. Suppression activities, again, would constitute the bulk of the potential for water resource damage.

**Cumulative Impacts:** In the event of a wildland fire, the effects on water quality and hydrology in the Monument would include increases in the speed and volumes of runoff and in sediment loadings. Accelerated runoff and erosion would increase sediment in streams and channels, adding to the sediment loads from other sources within and upstream from the Monument. The result would be short-term impacts to water quality

and hydrology. There is potential for minor to moderate adverse effects from erosion and elevated nutrient levels depending on the magnitude of a wildland fire event.

**Conclusion:** Under Alternative A, impacts to water resources resulting from fire events would be short term, minor to moderate, and adverse.

Because there would be no major, adverse impacts to a resource or value the conservation of which is (1) necessary to fulfill specific purposes identified in the enabling legislation of Congaree Swamp National Monument; (2) key to the natural or cultural integrity of the Monument; or (3) identified as a goal in the Monument's General Management Plan or other relevant National Park Service planning documents, there would be no impairment of the Monument's resources or values.

### **Alternative B - Full Suppression**

**Analysis:** Fire in the Monument would have limited adverse impact on water resources. Short-term effects of forest fires can include addition of sediment to streams which would increase in response to frequency or magnitude of precipitation events and extent of de-vegetation in burned areas (Christensen et al 1989), increased channel erosion in stream sections where riparian vegetation has burned (Hansen 1990), and increased stream temperatures resulting from loss of forest canopy (Helvey et al. 1976). Although the reduction of fire near term in the ecosystem may reduce the ground water yield, the effect would be negligible due to the consistent flooding events within the floodplain. Suppression actions and tactics hold the greatest potential for water quality impacts.

**Cumulative Impacts:** Same as Alternative A.

**Conclusion:** Under Alternative B, impacts to water resources resulting from fire events would be short term, minor to moderate, and adverse.

Because there would be no major, adverse impacts to a resource or value the conservation of which is (1) necessary to fulfill specific purposes identified in the enabling legislation of Congaree Swamp National Monument; (2) key to the natural or cultural integrity of the Monument; or (3) identified as a goal in the Monument's General Management Plan or other relevant National Park Service planning documents, there would be no impairment of the Monument's resources or values.

### **Alternative C - Prescribed Fire Only**

**Analysis:** Under this alternative, short-term effects of fires can include addition of sediment to streams which would increase in response to frequency or magnitude of precipitation events and extent of de-vegetation in burned areas (Christensen et al 1989), increased channel erosion in stream sections where riparian vegetation has burned (Hansen 1990), and increased stream temperatures resulting from loss of forest canopy (Helvey et al. 1976). Impacts to water quality from prescribed burning would be



controlled through the planning of prescribed wildland fire, and the protection of sensitive aquatic areas. The effects on water resources as a result of unplanned wildland fire events would be further mitigated through the use of prescribed fire to reduce hazard fuels in some areas. Suppression activities, again, would constitute the bulk of the potential for water resource damage.

**Cumulative Impacts:** Same as Alternative A.

**Conclusion:** Under Alternative C, impacts to water resources resulting from fire events would be short term, minor to moderate, and adverse.

Because there would be no major, adverse impacts to a resource or value the conservation of which is (1) necessary to fulfill specific purposes identified in the enabling legislation of Congaree Swamp National Monument; (2) key to the natural or cultural integrity of the Monument; or (3) identified as a goal in the Monument's General Management Plan or other relevant National Park Service planning documents, there would be no impairment of the Monument's resources or values.

#### **5.11: Wilderness**

Congaree Swamp National Monument will use the Minimum Requirement Analysis Worksheet (Appendix B) to complete a minimum requirements determination for the specific management activities identified in Section 4(c) of the Wilderness Act, i.e., use of a temporary road, use of motor vehicles, use of motorized equipment (and motorboats), aircraft overflights, the landing of aircraft, use of any form of mechanical transport, and the use of structures or installations. All proposed fire-management actions in wilderness or potential wilderness – including ranger activities, natural resource research and monitoring, cultural resource treatment-related activities, trail maintenance practices, facility placement or replacement, and special park uses – will be analyzed using this process. Except in the case of prescribed fire, the results of this analysis will be included in all final decision documents and will be approved by the Park Superintendent and/or Regional Director, as appropriate. For prescribed fire, the Monument has completed a programmatic minimum requirement determination as part of the planning process for managing wildland fire at COSW. All aspects of the prescribed fire program that are considered routine, or non-routine but predictable, have been evaluated using the minimum requirement analysis set forth at Appendix 13.3.1 of the WFMP. (A copy of the minimum requirement analysis for prescribed fire is included as Appendix C of this environmental assessment.) Following approval of the WFMP, these actions will be implemented without additional compliance following the identified (approved) methodologies. Any future activity undertaken in connection with prescribed fire that is not adequately addressed in the WFMP, but has the potential to affect the wilderness, will be analyzed separately using the park's minimum requirement procedure.

## **Alternative A - Combined Fire Program / No Action (Preferred Alternative)**

**Analysis:** Under this alternative, wilderness areas and potential wilderness areas within prescribed burn unit sites would be able to benefit from the reintroduction of fire into their ecosystems. Land use stratification, along with the full suppression tactics of the past, have resulted in the virtual elimination of fire in the landscape. This exclusion of fire has led to dramatic changes in the make up of the forest. Additionally, many of the burn unit areas consist of planted pines in various age classifications that, if left on their own, would likely stagnate and create potentially explosive fuel management problems.

Although seemingly contradictory, the use of some tree thinning operations, along with the reintroduction of fire to the ecosystem, would facilitate the restoration of wilderness values in these areas. Service guidelines for identifying and designating wilderness resources are detailed in Reference Manual (RM) 41 (USDI National Park Service 1999a). Section 6.2.1 of RM 41 states that "An area will not be excluded from a determination of wilderness suitability solely because established or proposed management practices require the use of tools, equipment, or structures, if those practices are necessary to meet the minimum requirements for the administration of the area as wilderness." Furthermore, "Lands that have been logged, farmed, grazed, mined, or otherwise utilized in ways not involving extensive development or alteration of the landscape may also be considered suitable for wilderness designation if, at the time of assessment, the effects of these activities are substantially unnoticeable **or their wilderness character could be maintained or restored through appropriate management actions**" (emphasis added). In short, the management activities contemplated by this alternative are necessary and appropriate for designated wilderness and would not disqualify potential wilderness from being designated as wilderness at some time in the future.

The short-term direct effects of this alternative are related to mechanical fuels reduction activities. Access to work sites, dragging of slash and downed timber would create negligible to minor aesthetic disturbance. Failure to implement a responsible prescribed fire strategy would create the most adverse long term effect with the resulting alteration of the wilderness landscape. Adverse effects within the floodplain would be related primarily to suppression actions and could be mitigated through the selection of suppression responses and adherence to the minimum impact suppression tactics (MIST) guidelines (see Appendix A).

**Cumulative Impacts:** Fire is a primal and natural force in the wilderness. The long term effects of implementing prescribed fire in the Monument would be beneficial in restoring the wilderness and the wilderness values, and would complement management activities to preserve the old-growth bottomland hardwood forest in the floodplain. Benefits to the Wilderness landscape from fire involve the maintenance of a diverse mosaic of vegetation structure, age classes and occurrence. The variable nature of fire historically shaped the diverse Wilderness landscape. Fluctuations in weather patterns, hydrology, topography, soils, fuels, and stand structure affected fire severity patterns. Elimination or deprivation of fire in the wilderness would only serve to sustain long term adverse effects.

**Conclusion:** The fire suppression and fuel management activities called for by Alternative A would generate noise, involve the use of mechanized equipment, and leave temporary scars on the landscape, thereby adversely affecting wilderness

resources and values. These impacts would be short-term, negligible to minor and adverse. Alternative A would authorize the use of the “confine” or “contain” strategies during suppression activities in addition to direct control. As a result, this alternative would result in less use of mechanized equipment in the wilderness and fewer physical impacts to wilderness resources. In the long term, the impact of Alternative A on wilderness resources would be minor to moderate and beneficial. Impacts would be more beneficial under Alternative A than under the other alternatives because use of the “confine” or “contain” strategies would allow a more natural fire regime in the wilderness.

Because there would be no major, adverse impacts to a resource or value the conservation of which is (1) necessary to fulfill specific purposes identified in the enabling legislation of Congaree Swamp National Monument; (2) key to the natural or cultural integrity of the Monument; or (3) identified as a goal in the Monument’s General Management Plan or other relevant National Park Service planning documents, there would be no impairment of the Monument’s resources or values.

### **Alternative B – Full Suppression**

**Analysis:** The exclusion of fire as a result of the stratification of the woodland, as well as the aggressive implementation of fire suppression has led to dramatic changes in the make up of the forest community. Additionally, much of the upland areas of the Monument consist of planted pines in various age classifications that if left on their own would likely stagnate and create potentially explosive fuel management problems. Although seemingly contradictory, the use of some tree thinning operations will facilitate the restoration of wilderness values in these areas. In contrast, the continued exclusion of fire will continue to maintain the forest as a human-altered ecosystem.

**Cumulative Impacts:** Fire is a primal and natural force in the wilderness. The variable nature of fire historically shaped the diverse wilderness landscape. Fluctuations in weather patterns, hydrology, topography, soils, fuels, and stand structure affected fire severity patterns. Elimination or deprivation of fire in the wilderness would only serve to maintain an altered environment and sustain the long term adverse effects of fire exclusion.

**Conclusion:** Direct full suppression activities (control strategy) would perpetuate a human-altered ecosystem and increase the possibility of devastating wildfires, with ecological effects far in excess of what occurred naturally in presettlement times. Impacts to wilderness resources and values would be moderate to major, long-term, and adverse.

This alternative would result in moderate to major adverse impacts to a resource or value the conservation of which is (1) necessary to fulfill specific purposes identified in the enabling legislation of Congaree Swamp National Monument; (2) key to the natural or cultural integrity of the Monument; or (3) identified as a goal in the Monument's General Management Plan or other relevant National Park Service planning documents. Accordingly, this alternative would result in impairment of the Monument's resources or values.

### **Alternative C – Prescribed Fire Only**

**Analysis:** Under this alternative, wilderness areas and potential wilderness areas within prescribed burn unit sites would be able to benefit from the reintroduction of fire into their ecosystems. Land use stratification, along with the full suppression tactics of the past, have resulted in the virtual elimination of fire in the landscape. This exclusion of fire has led to dramatic changes in the make up of the forest. Additionally, many of the burn unit areas consist of planted pines in various age classifications that if left on their own would likely stagnate and create potentially explosive fuel management problems. Although seemingly contradictory, the use of some tree thinning operations, along with the reintroduction of fire to the ecosystem, would facilitate the restoration of wilderness values in these areas. Service guidelines for identifying and designating wilderness resources are detailed in Reference Manual (RM) 41 (USDI National Park Service 1999a). Section 6.2.1 of RM 41 states that "An area will not be excluded from a determination of wilderness suitability solely because established or proposed management practices require the use of tools, equipment, or structures, if those practices are necessary to meet the minimum requirements for the administration of the area as wilderness." Furthermore, "Lands that have been logged, farmed, grazed, mined, or otherwise utilized in ways not involving extensive development or alteration of the landscape may also be considered suitable for wilderness designation if, at the time of assessment, the effects of these activities are substantially unnoticeable **or their wilderness character could be maintained or restored through appropriate management actions**" (emphasis added). In short, the management activities contemplated by this alternative are necessary and appropriate for designated wilderness and would not disqualify potential wilderness from being designated as wilderness at some time in the future.

The short-term direct effects of this alternative are related to mechanical fuels reduction activities. Access to work sites, dragging of slash and downed timber would create negligible to minor aesthetic disturbance. Failure to implement a responsible prescribed fire strategy would create the most adverse long term effect with the resulting alteration of the wilderness landscape.

**Cumulative Impacts:** Fire is a primal and natural force in the wilderness. The long term effects of implementing prescribed fire in the Monument would be beneficial in restoring the wilderness and the wilderness values. Benefits to the Wilderness landscape from fire involve the maintenance of a diverse mosaic of vegetation structure, age classes and occurrence. The variable nature of fire historically shaped

the diverse Wilderness landscape. Fluctuations in weather patterns, hydrology, topography, soils, fuels, and stand structure affected fire severity patterns. Elimination or deprivation of fire in the wilderness would only serve to sustain long term adverse effects.

**Conclusion:** The prescribed fire and suppression activities called for by Alternative C would generate noise, involve the use of mechanized equipment, and leave temporary scars on the landscape, thereby adversely affecting wilderness resources and values. These impacts would be short-term, negligible to minor and adverse. Short-term impacts to wilderness and potential wilderness would be greater under Alternative C than under Alternative A because use of the “control” strategy during suppression activities would involve greater, and more intensive, use of mechanized equipment. In the long term, the impact of these activities on wilderness resources would be minor to moderate and beneficial. Overall, the long-term beneficial impacts of Alternative C would be less than those of Alternative A because Alternative C would not allow use of the “confine” or “contain” strategies during suppression activities, with the result that the beneficial effects of fire would extend to a smaller area.

Because there would be no major, adverse impacts to a resource or value the conservation of which is (1) necessary to fulfill specific purposes identified in the enabling legislation of Congaree Swamp National Monument; (2) key to the natural or cultural integrity of the Monument; or (3) identified as a goal in the Monument’s General Management Plan or other relevant National Park Service planning documents, there would be no impairment of the Monument’s resources or values.

#### **5.12: Public Health & Safety**

##### **Alternative A - Combined Fire Program / No Action (Preferred Alternative)**

**Analysis:** Safety of the public and Monument personnel is the number one priority of the Congaree Swamp National Monument fire management program. Federal Wildland Fire Management Policy as implemented through National Park Service Director's Order - 18 reinforces that concept. Under this alternative, a combination of safety and resource impacts would be controlled through the planning and implementation of prescribed wildland fire. Under this alternative, prescribed fire would be used to further reduce hazardous fuels and to restore ecosystem processes. Implementing a prescribed burn, fire managers must consider the safety as well as the results of the prescribed fire. Due to the controlled nature of a prescribed burn, as confirmed through the use of an approved prescribed fire plan, risks to public health and safety would be minimized. Reduction in hazardous fuel loading and the protection of sensitive resource areas would be accomplished through the use of thinning, prescribed wildland fire and wildland fire suppression. Potential wildland fire conflagrations would be reduced. With careful planning and execution of prescribed fires, adverse effects to public health and safety resulting from prescribed burning would be short-term, local, and negligible. In the long-term there is an expectation that the severity of wildland fires would decrease as more of the Monument's hazard fuels are treated with prescribed fire and mechanical fuel reduction projects. A decrease in fire severity reduces fire containment

times, thereby reducing the total area impacted by that wildland fire event. A reduction in the severity of a fire and the associated effort needed to stop its spread would reduce the amount of time that the public, Monument personnel and firefighters are exposed to the wildland fire situation, presumably resulting in moderate long-term, beneficial, local and regional effects to public health and safety. Research and study of prescribed wildland fire could result in the implementation of wildland fire use for resource benefit to bring the biotic ecosystem into line with historic natural fire events in order to promote and maintain natural wilderness processes.

**Cumulative Impacts:** Educational efforts aimed at nearby private landowners would encourage private landowners to maintain defensible spaces around their homes and properties. Successful education, implementation of fire protection measures, and cooperation with regional firefighting organizations, in conjunction with the management strategies proposed in the fire management plan, would have a moderate, regional, beneficial cumulative effect by decreasing the potential for wildland fire ignition and spread, thus protecting public health and safety.

**Conclusion:** Effects to public health resulting from smoke emissions associated with prescribed burning and slash-pile burning would be short-term, local, adverse, and negligible. Long-term effects, associated with a reduced potential for wildland fire to escalate or migrate outside the Monument, would be beneficial and minor to moderate.

## **Alternative B – Full Suppression**

**Analysis:** In the near term this alternative appears to provide the highest level of protection for public health and safety. However, over time this alternative may degrade or alter the natural ecosystems that are dependent on fire. Additionally, the unnatural buildup of fuel loading may cause catastrophic fires, resulting in the use of excessive suppression tactics to bring the fire under control. These suppression tactics would constitute the majority of negative impacts to the Monument's resources. Potential wildland fire conflagrations would impact negatively on firefighter and public safety as well. Wildland fire suppression is a "hazardous duty" task. The risks inherent in small fires are compounded in larger, higher intensity fires as a result of higher levels of smoke, use of more intensive suppression tactics, and the increased potential for unexpected and extreme fire behavior. This alternative relies on full suppression actions to insure the safety of the public, Monument personnel, and firefighters. The impacts are directly related to the severity of the fire and its location. A severe fire has greater potential to impact the safety of the public, Monument personnel, and firefighters. If Alternative B is implemented, fuel loads would continue to accumulate and the risk of exposure to wildland fire would increase. Extreme effects to public health and safety from wildland fire include loss of life and property, injury, and health effects caused by exposure to smoke emissions. Current fire management actions would have a minor to moderate, short- and long-term, adverse effect on public health and safety.

**Cumulative Impacts:** Same as alternative A.

**Conclusion:** This alternative would have an adverse, short- and long-term, minor to moderate effect on public health and safety in the event of a wildland fire.

### **Alternative C - Prescribed Fire Only**

**Analysis:** This alternative presents the lowest amount of risk due to the planning of prescribed wildland fire under prescribed conditions by fire management specialists. Although wildland fires and escaped prescribed wildland fires would still be suppressed, the potential for conflagration would be reduced through the use of prescribed wildland fire for the reduction of hazardous fuel loading. Safety of fire-fighting personnel and the public would be preplanned and accounted for and the potential for wildland fire conflagration hazards reduced.

**Cumulative Impacts:** Same as Alternative A.

**Conclusion:** Effects to public health resulting from smoke emissions associated with prescribed burning and slash-pile burning would be short-term, local, adverse, and negligible. Long-term effects, associated with a reduced potential for wildland fire to escalate or migrate outside the Monument, would be beneficial and minor to moderate.

### **5.13: Visitor Use and Experience**

#### **Alternative A - Combined Fire Program / No Action (Preferred Alternative)**

**Analysis:** This alternative would allow for fuel reduction methods that would lessen the chance of visitors being subjected to adverse impacts of a wildland fire event. Fuel reduction activities, such as prescribed burning, would cause short-term public use restrictions resulting in negligible to minor effects on visitor use and experience. Mechanical thinning and creation of slash piles would impact relatively small sites within the treatment areas and it could be expected to cause short-term, negligible to minor, adverse impacts on the visitor experience. Slash piles would be moved away from the visitor center and other visitor use areas and burned offsite to avoid both direct and localized adverse impacts to areas that receive large numbers of visitors. Burning slash piles in areas rarely frequented by visitors would have a short-term, negligible, adverse impact on the visitor experience. Prescribed burns in treatment areas adjacent to access roads would have a direct, negligible to minor, adverse effect on the tourist experience, depending on the size of the burn and climatic conditions. Smoke resulting from prescribed burns in areas of the Monument not frequently used by visitors may produce indirect negligible to minor adverse impacts on the visitor experience by affecting the view-shed. In general, prescribed burn effects would be localized, have short term, adverse impacts and provide the long-term beneficial effect of reducing the chance for wildland fire events that would cause a substantial disruption to visitor use and experience. Educational materials and interpretive programs would explain the need and benefits of prescribed burning.

**Cumulative Impacts:** Implementation of Alternative A would result in long-term minor to moderate, beneficial cumulative effects on visitor use as a result of the reduced potential for wildland fire events.

**Conclusion:** Reduction in the amount of hazardous fuels would have a direct, long-term, beneficial effect on the visitor experience. Fuel reduction would lessen the chance of visitors being subjected to adverse impacts of a wildland fire that could potentially close the Monument or char the landscape, altering the quality of the experience. Although the effects would be localized, there would be minor to moderate, beneficial impacts on the visitor experience due to the reduced potential for wildland fire and an improved landscape scene. Negligible to minor short-term adverse effects to visitor experience and use would occur from public access restrictions during management and prescribed burning activities.

### **Alternative B – Full Suppression**

**Analysis:** The high fuel load resulting from the buildup of plant debris generates a higher probability of a wildland fire. The continuation of current conditions could lead to a wildland fire event that would have direct, short-term adverse impacts. Depending on the magnitude of the wildland fire, adverse impacts would be negligible to moderate, potentially closing the Monument or portions of the Monument, disrupting tourist use and activities. Monument staff normally devoted to visitor services would have their responsibilities diverted. Long-term, minor adverse effects would include the change of scenery and loss of recreational opportunities in the aftermath of wildland fires.

**Cumulative Impacts:** Under this alternative, in the absence of prescribed fire for fuels management, there is increased potential for wildland fires to cross the Monument boundary from, or to, private property. Existing high fuel levels within the Monument would magnify the impact of fire coming into the Monument from outside, potentially closing portions of the Monument to visitor use and would have a potential minor to moderate, short-term adverse effect on visitor experience.

**Conclusion:** The potential for wildland fire events would remain high due to a continued build-up of hazardous fuels within the Monument. This alternative would have an adverse, direct, short-term effect on the visitor experience, potentially limiting or restricting access to the Monument and/or closing portions of the Monument to visitor use due to smoke and concerns for visitor safety.

### **Alternative C – Prescribed Fire Only**

**Analysis:** This alternative would allow for fuel reduction methods that would lessen the chance of visitors being subjected to adverse impacts of a wildland fire event. Fuel reduction activities, such as prescribed burning, would cause short-term public use restrictions resulting in negligible to minor effects on visitor use and experience. Mechanical thinning and creation of slash piles would impact relatively small sites within



the treatment areas and it could be expected to cause short-term, negligible to minor, adverse impacts on the visitor experience. Slash piles would be moved away from the visitor center and other visitor use areas and burned offsite to avoid both direct and localized adverse impacts to areas that receive large numbers of visitors. Burning slash piles in areas rarely frequented by visitors would have a short-term, negligible, adverse impact on the visitor experience. Prescribed burns in treatment areas adjacent to access roads would have a direct, negligible to minor, adverse effect on the tourist experience, depending on the size of the burn and climatic conditions. Smoke resulting from prescribed burns in areas of the Monument not frequently used by visitors may produce indirect negligible to minor adverse impacts on the visitor experience by affecting the view-shed. In general, prescribed burn effects would be localized, have short term, adverse impacts and provide the long-term beneficial effect of reducing the chance for wildland fire events that would cause a substantial disruption to visitor use and experience. Educational materials and interpretive programs would explain the need and benefits of prescribed burning.

***Cumulative Impacts:*** Same as alternative A.

***Conclusion:*** Reduction in the amount of hazardous fuels would have a direct, long-term, beneficial effect on the visitor experience. Fuel reduction would lessen the chance of visitors being subjected to adverse impacts of a wildland fire that could potentially close the Monument or char the landscape, altering the quality of the experience. Although the effects would be localized, there would be minor to moderate, beneficial impacts on the visitor experience due the reduced potential for wildland fire and an improved landscape scene. Negligible to minor short-term adverse effects to visitor experience and use would occur from public access restrictions during management and prescribed burning activities.

#### ***5.14: Monument Operations***

##### **Alternative A - Combined Fire Program / No Action (Preferred Alternative)**

***Analysis:*** In addition to the implementation of mechanical fuel reduction and a prescribed fire program, this action would also include monitoring weather conditions and notifying Monument neighbors of when and where prescribed burning would take place. Adverse effects to Monument operations would be negligible and short-term and would not add considerably to the workload of Monument staff.

If the Monument contracts services commensurate to implementation of the mechanical fuel reduction called for under Alternative B, there would be negligible, short-term adverse effects as a result, and Monument staff would be available to perform their regular duties. Other than activities such as plan writing and monitoring of services, there would not be any treatment-related effects on other Monument operations or the allocation of resources and staff.

The preferred alternative would reduce fuel loads throughout the Monument and its border. This defensible space would be advantageous to firefighting efforts. This would represent a moderate, long-term, beneficial effect to the Monument staff.

***Cumulative Impacts:*** Monument operations would experience a long-term, moderately beneficial effect as a result of the implementation of the preferred alternative. The ultimate effect of fire management plans and projects would reduce the likelihood of a wildland fire event, which in turn would reduce the potential for the disruption of Monument operations that would accompany a wildland fire.

***Conclusion:*** Alternative A would result in negligible, short-term, localized, adverse effects to Monument operations from treatment implementation. Long-term effects to Monument operations would be moderately beneficial and result from reduced potential for wildland fire.

### **Alternative B – Full Suppression**

***Analysis:*** Under Alternative B, the increased likelihood of a wildland fire migrating across Monument boundaries would have a negligible to moderate, direct, short-term, adverse impact on Monument operations, assuming that a wildland fire would occur. In such an event, the Monument's total suppression management strategy requires a large commitment of staff and resources to manage, coordinate, and fight the wildland fire.

***Cumulative Impacts:*** Alternative B would have a minor to moderate, adverse cumulative impact on management projects occurring in the Monument.

***Conclusion:*** The effects of this alternative on Monument operations would predominantly result from a wildland fire occurring within or migrating into the Monument. The coincident effects on Monument operations would be direct, local, short-term, adverse, and minor to moderate.

### **Alternative C – Prescribed Fire Only**

***Analysis:*** This alternative would involve staff implementation of a prescribed fire program, including monitoring weather conditions and notifying Monument neighbors of when and where prescribed burning would take place. Adverse effects to Monument operations would be negligible and short-term and would not add considerably to the workload of Monument staff. Other than activities such as plan writing and monitoring of services, there would not be any treatment-related effects on other Monument operations or the allocation of resources and staff.

This alternative would reduce fuel loads throughout the Monument and its border. This defensible space would be advantageous to firefighting efforts. This would represent a moderate, long-term, beneficial effect to the Monument staff. Beneficial impacts would

be less under this alternative than under Alternative A because the lack of mechanical clearing would increase the threat of wildfire. In addition, the required use of full suppression (control strategy) during wildland fire events could involve a greater commitment of resources.

***Cumulative Impacts:*** Same as Alternative A.

***Conclusion:*** Alternative C would result in negligible, short-term, localized, adverse effects to Monument operations from treatment implementation. Long-term effects to Monument operations would be moderately beneficial and result from reduced potential for wildland fire.

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## 6.0: COORDINATION AND CONSULTATION

This Environmental Assessment of the Fire Management Plan and the Fire Management Plan will be sent to the following agencies and personnel for review and comment. Additionally these documents will be posted on the parks web site.

|  |  |
|--|--|
| Robin Toole  | NPS Southeast Region, Fire Planner                             |
| Ken Garvin   | NPS Southeast Region, Fire Management Officer                  |
| Kevin Walsh  | NPS Southeast Region, Prescribed Fire Management               |
| Jami Hammond   | NPS Southeast Region, Environmental Compliance                 |
| Larry West   | NPS Southeast Region, Inventory & Monitoring Coordinator       |
| Allen Bohnert  | NPS Southeast Region, Cultural Resources                       |
| John Ehrenhard   | NPS Southeast Archeological Center                             |
| Rick Sayers  | U.S. Fish and Wildlife Service, Endangered Species             |
| Charles Kerr   | U.S. Forest Service, Francis Marion-Sumter National Forest     |
| Jerome Thomas  | Forest Supervisor, Francis Marion-Sumter National Forest       |
| Steve Wells  | Fire, Lands, & Minerals, Francis Marion-Sumter National Forest |
| Bob Schowalter   | SC State Forester, South Carolina Forestry Commission          |
| Chad Long  | South Carolina State Historic Preservation Office              |
| John D. Jansen, Jr.  | City of Columbia Fire Department                               |
| Jimmy James  | Gadsden Volunteer Fire Department                              |
| Dick Watkins   | Friend of Congaree Swamp                                       |
| Adjacent Landowners of the Monument in Richland County, SC |  |
| Cawtawba Indian Nation Representative                      |  |

Prepared by:

Patrick T. Dege  
Fire Management Officer, Congaree Swamp National Monument

(This document will be incorporated into the WFMP as Appendix 13.3.2)

## **MINIMUM IMPACT SUPPRESSION TACTICS “MIST” GUIDELINES**

### **CONCEPT**

The concept of Minimum Impact Suppression Tactics (MIST) is to use the minimum amount of forces necessary to effectively achieve the fire management protection objectives consistent with land and resource management objectives. It implies a greater sensitivity to the impacts of suppression tactics and their long-term effects when determining how to implement an appropriate suppression response. In some cases MIST may indicate cold trailing or wet line may be more appropriate than constructed hand line. In another example, the use of an excavator may be used rather than a dozer. Individual determinations will be dependent on the specific situation and circumstances of each fire.

MIST is not intended to represent a separate or distinct classification of firefighting tactics but rather a mind set of how to suppress a wildland fire while minimizing the long-term effects of the suppression action. When the term MIST is used in this document it reflects the above principle.

Suppression actions on all wildland fires within National Park Service protected wilderness in the Congaree Swamp National Monument will be those having a minimum impact on the physical resources associated with each site. In so doing, the principle of fighting fire aggressively but providing for safety first will not be compromised.

The key challenge to the line officer, fire manager and firefighter is to be able to select the wildland fire suppression tactics that are appropriate given the fire's probable or potential behavior. The guiding principle is always least cost plus loss while meeting land and resource management objectives. It is the second part of this statement which must be recognized more than it has in the past. Appreciation of the values associated with wilderness has been more difficult to articulate but, nevertheless, is important. As this recognition emerges, actions must be modified to accommodate a new awareness of them.

These actions, or MIST, may result in an increase in the amount of time spent watching, rather than disturbing, a dying fire to insure it does not rise again. They may also involve additional rehabilitation measures on the site that were not previously carried out.

When selecting an appropriate suppression response, firefighter safety must remain the highest concern. In addition, fire managers must be assured the planned actions will be effective and will remain effective over the expected duration of the fire.

### **GOAL**

The goal of MIST is to halt or delay fire spread in order to maintain the fire within predetermined parameters while producing the least possible impact on the resource being protected. These parameters are represented by the initial attack incident commander's size-up of the situation in the case of a new start or by the escaped fire situation analysis (EFSA) in case of an escaped fire.

It is important to consider probable rehabilitation need as a part of selecting the appropriate suppression response. Tactics that reduce the need for rehab are preferred whenever feasible.

## **GUIDELINES**

Following is a list of considerations for each fire situation.

### **Hot-Line/Ground Fuels**

- Allow fire to burn to natural barriers.
- Use cold-trail, wet line or combination when appropriate.
- If constructed fireline is necessary, use only width and depth to check fire spread.
- Burn out and use low impact tools like swatter or 'gunny' sack.
- Minimize bucking and cutting of trees to establish fireline; build line around logs when possible.
- Constantly re-check cold trailed fireline.

### **Hot-Line/Aerial Fuels**

- Limb vegetation adjacent to fireline only as needed to prevent additional fire spread.
- During fireline construction, cut shrubs or small trees only when necessary. Make all cuts flush with the ground.
- Minimize felling of trees and snags unless they threaten the fireline or seriously endanger workers. In lieu of felling, identify hazard trees with a lookout or flagging.
- Scrape around tree bases near fireline if it is likely they will ignite.

### **Mopup/Ground Fuels**

- Do minimal spading; restrict spading to hot areas near fireline.
- Cold-trail charred logs near fireline; do minimal tool scarring.
- Minimize bucking of logs to extinguish fire or to check for hotspots; roll the logs instead if possible.
- Return logs to original position after checking and when ground is cool.
- Refrain from making bone yards; burned and partially burned fuels that were moved should be returned to a natural arrangement.
- Consider allowing large logs to burnout. Use a lever rather than bucking to manage large logs which must be extinguished.
- Personnel should avoid using rehabilitated firelines as travel corridors whenever possible because of potential soil compaction and possible detrimental impacts to rehab work, i.e. water bars.

### **Mopup/Aerial Fuels**

- Remove or limb only those fuels which if ignited have potential to spread fire outside the fireline.
- Before felling consider allowing ignited tree/snag to burn itself out. Ensure adequate safety measures are communicated if this option is chosen.

- Identify hazard trees with a lookout or flagging.
- If burning trees/snag poses a serious threat of spreading fire brands, extinguish fire with water or dirt whenever possible. Felling by crosscut or chainsaw should be the last resort.
- Align saw cuts to minimize visual impacts from more heavily traveled corridors. Slope cut away from line of sight when possible.

## **LOGISTICS**

### **Campsite Considerations**

- Locate facilities outside of wilderness whenever possible.
- Coordinate with the Resource Advisor in choosing a site with the most reasonable qualities of resource protection and safety concerns.
- Evaluate short-term low impact camps such as coyote or spike versus use of longer-term higher impact camps.
- Use existing campsites if possible.
- New site locations should be on impact resistant and naturally draining areas such as rocky or sandy soils, or openings with heavy timber.
- Avoid camps in meadows, along streams or on lakeshores. Located at least 200 feet from lakes, streams, trails, or other sensitive areas.
- Consider impacts on both present and future users. An agency commitment to wilderness values will promote those values to the public.
- Lay out the camp components carefully from the start. Define cooking, sleeping, latrine, and water supply.
- Minimize the number of trails and ensure adequate marking.
- Consider fabric ground cloth for protection in high use areas such as around cooking facilities.
- Use commercial portable toilet facilities where available. If these cannot be used a latrine hole should be utilized.
- Select latrine sites a minimum of 200 feet from water sources with natural screening.
- Do not use nails in trees.
- Constantly evaluate the impacts which will occur, both short and long term.

### **Personal Camp Conduct**

- Use “leave no trace” camping techniques.
- Minimize disturbance to land when preparing bedding site. Do not clear vegetation or trench to create bedding sites.
- Use stoves for cooking, when possible. If a campfire is used limit to one site and keep it as small as reasonable. Build either a “pit” or “mound” type fire. Avoid use of rocks to ring fires.
- Use down and dead firewood. Use small diameter wood, which burns down more cleanly.
- Don’t burn plastics or aluminum – “pack it out” with other garbage.
- Keep a clean camp and store food and garbage so it is unavailable to bears. Ensure items such as empty food containers are clean and odor free, never bury them.
- Select travel routes between camp and fire and define clearly.



- Carry water and bathe away from lakes and streams. Personnel must not introduce soaps, shampoos or other personal grooming chemicals into waterways.

## **AVIATION MANAGEMENT**

One of the goals of wilderness managers is to minimize the disturbance caused by air operations during an incident.

### **Aviation Use Guidelines**

- Maximize back haul flights as much as possible.
- Use long line remote hook in lieu of constructed helispots for delivery or retrieval of supplies and gear.
- Take precautions to insure noxious weeds are not inadvertently spread through the deployment of cargo nets and other external loads.
- Use natural openings for helispots and paracargo landing zones as far as practical. If construction is necessary, avoid high visitor use areas.
- Consider maintenance of existing helispots over creating new sites.
- Obtain specific instructions for appropriate helispot construction prior to the commencement of any ground work.
- Consider directional falling of trees and snags so they will be in a natural appearing arrangement.
- Buck and limb only what is necessary to achieve safe/practical operating space in and around the landing pad area.

### **Retardant Use**

During initial attack, fire managers must weigh the non-use of retardant with the probability of initial attack crews being able to successfully control or contain a wildland fire. If it is determined that use of retardant may prevent a larger, more damaging wildland fire, then the manager might consider retardant use even in sensitive areas. This decision must take into account all values at risk and the consequences of larger firefighting forces' impact on the land.

- Consider impacts of water drops versus use of foam/retardant. If foam/retardant is deemed necessary, consider use of foam before retardant use.

## **HAZARDOUS MATERIALS**

### **Flammable/Combustible Liquids**

- Store and dispense aircraft and equipment fuels in accordance with National Fire Protection Association (NFPA) and Health and Safety Handbook requirements.
- Avoid spilling or leakage of oil or fuel, from sources such as portable pumps, into water sources or soils.
- Store any liquid petroleum gas (propane) downhill and downwind from firecamps and away from ignition sources.

### Flammable Solids

- Pick up residual fusees debris from the fireline and dispose of properly.

### Fire Retardant/Foaming Agents

- Do not drop retardant or other suppressants near surface waters.
- Use caution when operating pumps or engines with foaming agents to avoid contamination of water sources.

## FIRE REHABILITATION

Rehabilitation is a critical need. This need arises primarily because of the impacts associated with fire suppression and the logistics that support it. The process of constructing control lines, transport of personnel and materials, providing food and shelter for personnel, and other suppression activities has a significant impact on sensitive resources regardless of the mitigating measures used. Therefore, rehabilitation must be undertaken in a timely, professional manner.

During implementation, the resource manager should be available for expert advice and support of personnel doing this work as well as quality control.

### Rehabilitation Guidelines

- Pick up and remove all flagging, garbage, litter, and equipment. Dispose of trash appropriately.
- Clean fire pit of unburned materials and fill back in.
- Discourage use of newly established trails created during the suppression effort by covering with brush, limbs, small diameter poles, and rotten logs in a naturally appearing arrangement.
- Replace dug-out soil and/or duff and obliterate any berms created during the suppression effort.
- If impacted trails have developed on slopes greater than six percent, construct waterbars according to the following waterbar spacing guide:

| Trail Percent Grade | Maximum Spacing Ft. |
|---------------------|---------------------|
| 6-9                 | 400                 |
| 10-15               | 200                 |
| 15-25               | 100                 |
| 25+                 | 50                  |

- Where soil has been exposed and compacted, such as in camps, on user-trails, at helispots and pump sites, scarify the top 2-4 inches and scatter with needles, twigs, rocks, and dead branches. It is unlikely that seed and fertilizer for barren areas will be appropriate, in order to maintain the genetic integrity of the area. It may be possible, depending on the time of year and/or possibility of a rainy period, to harvest and scatter nearby seed, or to transplant certain native vegetation.

- Blend campsites with natural surroundings, by filling in and covering latrine with soil and/or other natural material. Naturalize campfire area by scattering ashes in nearby brush (after making sure any sparks are out) and returning site to a natural appearance.
- Where trees were cut or limbed, cut stumps flush with ground, scatter limbs and boles, out of sight in unburned area. Camouflage stumps and tree boles using rocks, dead woody material, fragments of stumps, bolewood, limbs, soil and fallen or broken green branches. Scattered sawdust and shavings will assist in decomposition and be less noticeable. Use native materials from adjacent, unimpacted areas if necessary.
- Remove newly cut tree boles that are visible from trails or meadows. Drag other highly visible woody debris created during the suppression effort into timbered areas and disburse. Tree boles that are too large to move should be slant cut so a minimal amount of the cut surface is exposed to view. Chopping up the surface with an axe or pulaski, to make it jagged and rough, will speed natural decomposition.
- Leave tops of felled trees attached. This will appear more natural than scattering the debris.
- Consider, if no other alternatives are available, helicopter sling loading rounds and tops from a disturbed site when there has been an excessive amount of bucking, limbing and topping.
- Tear out sumps or dams, where they have been used, and return site to natural condition. Replace any displaced rocks or streambed material that has been moved. Reclaim streambed to its predisturbed state, when appropriate.
- Walk through adjacent undisturbed area and take a look at your rehab efforts to determine your success at returning the area to as natural a state as possible. Good examples should be documented and shared with others!

## **DEMOBILIZATION**

Because demob is often a time when people are tired or when weather conditions are less than ideal, enough time must be allowed to do a good job. When moving people and equipment, choose the most efficient and least impactful method to both the landscape and fire organization mission. An on-the-ground analysis of “How Things Went” will be important.

## **POST-FIRE EVALUATION**

Post-fire evaluation is important for any fire occurrence so management can find out how things went. Identify areas needing improvement, to formulate strategies and to produce quality work in the future. This activity is especially important in wilderness and like sensitive areas due to their fragility and inclination to long-term damage by human impacts.

Resource managers and specialists will be responsible for conducting the post-fire evaluation. They are the people who have the experience and knowledge to provide information required to make the evaluation meaningful and productive.

Post-fire evaluation will consist of data collection, documentation and recommendations. This process and report will, in most cases, be fairly simple and to the point. It should be accomplished before an overhead team departs from the fire. The evaluation emphasis should be on the MIST actions and not on the effects on the fire.

Evaluation will be completed on wildland fires exceeding 100 acres and on all prescribed fires.

## MINIMUM TOOL ANALYSIS WORKSHEET

# MINIMUM REQUIREMENT ANALYSIS WORKSHEET

## CONGAREE SWAMP NATIONAL MONUMENT

COSW-180 (7/2003)

PROPOSED ACTION:

DATE:

LEAD PERSON(S):

WORK  
UNIT(S):**PART A: Minimum Requirement** (*should the action be done in wilderness*)

|          |   |  |
|----------|---|--|
| <b>1</b> | IS ACTION AN EMERGENCY?   | Answer: <input type="checkbox"/> Yes <input type="checkbox"/> No<br>Explain: |
|          | <p>YES</p> <p>↓</p> <p>ACT ACCORDING TO<br/>APPROVED EMERGENCY<br/>MINIMUM TOOL CRITERIA</p>                        |  |
|          | <p>NO</p> <p>↓</p>  |  |
| <b>2</b> | DOES ACTION CONFLICT WITH LEGISLATION,<br>PLANNED WILDERNESS GOALS, OBJECTIVES<br>OR FUTURE DESIRED CONDITIONS?     | Answer: <input type="checkbox"/> Yes <input type="checkbox"/> No<br>Explain: |
|          | <p>YES</p> <p>↓</p> <p>DO NOT DO IT</p>   |  |
|          | <p>NO</p> <p>↓</p>  |  |
| <b>3</b> | IS ACTION PRE-APPROVED BY<br>THE WILDERNESS AND BACKCOUNTRY<br>OR OTHER PARK MANAGEMENT PLAN?                       | Answer: <input type="checkbox"/> Yes <input type="checkbox"/> No<br>Explain: |
|          | <p>YES</p> <p>↓</p> <p>DO ACCORDING TO<br/>APPROVED CRITERIA</p>  |  |
|          | <p>NO</p> <p>↓</p>  |  |
| <b>4</b> | CAN ACTION BE ACCOMPLISHED<br>THROUGH A LESS INTRUSIVE ACTION THAT<br>SHOULD BE TRIED FIRST? (Visitor Education...) | Answer: <input type="checkbox"/> Yes <input type="checkbox"/> No<br>Explain: |
|          | <p>YES</p> <p>↓</p> <p>DO IT</p>  |  |
|          | <p>NO</p> <p>↓</p>  |  |

|  |   |   |
|--|---|---|
| <b>5</b>   | CAN ACTION BE ACCOMPLISHED OUTSIDE OF WILDERNESS AND STILL ACHIEVE ITS OBJECTIVES?  | Answer: <input type="checkbox"/> Yes <input type="checkbox"/> No<br>Explain:  |
|  | <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;">             YES<br/>↓           </div> <div style="text-align: center;">             NO<br/>↓           </div> </div> <div style="display: flex; justify-content: space-around; margin-top: 20px;"> <div style="border: 1px solid black; padding: 10px; width: 40%;">DO IT THERE</div> <div style="border: 1px solid black; padding: 10px; width: 40%;">DO PART B</div> </div> |   |
| <b>PART B: Minimum Tool (<i>how the action should be done in wilderness</i>)</b> |   |   |
| <b>6</b>   | DESCRIBE, IN DETAIL, ALTERNATIVE WAYS TO ACCOMPLISH THE PROPOSED ACTION *<br>(These may include, primitive skill/tool, mechanized/ motorized, and/or combination alternatives)<br>(Use addition pages if necessary)   | * Minimum questions to answer for each alternative:<br>What is proposed?<br>Where will the action take place?<br>When will the action take place?<br>What design and standards will apply?<br>What methods and techniques will be used?<br>How long will it take to complete the action?<br>Why is it being proposed in this manner?<br>What mitigation will take place to minimize action impacts? |
|  | ↓<br><b>GO TO NEXT STEP</b>   |   |
| <b>7</b>   | EVALUATE WHICH ALTERNATIVE WOULD HAVE THE LEAST OVERALL IMPACT ON WILDERNESS RESOURCES, CHARACTER AND VISITOR EXPERIENCE **   | ** Minimum criteria used to evaluate each alternative:<br>Biophysical effects<br>Social/Recreational/Experiential effects<br>Societal/Political effects<br>Health/Safety concerns<br>Economical/Timing considerations   |
|  | ↓<br><b>GO TO NEXT STEP</b>   |   |
| <b>8</b>   | SELECT AN APPROPRIATE, PREFERRED ALTERNATIVE  | IF<br>→<br>REQUIRED   |
|  |   | <b>9</b> ATTACH TO APPROPRIATE PROJECT PROPOSAL/CLEARANCE FORM FOR REVIEW AND APPROVAL/DISAPPROVAL SIGNATURE  |

**PROJECT SUMMARY:**

Goals:

Objectives:

**Alternative 1 - \_\_\_\_\_**

*a. What is proposed?*

*b. Where will the action take place?*

*c. When will the action take place?*

*d. What design and standards will apply?*

*e. What methods and techniques will be used?*

*f. How long will it take to complete the action?*

*g. Why is it being proposed in this manner?*

*h. What mitigation will take place to minimize the impact?*

***Analysis:***

**Alternative 2 – \_\_\_\_\_**

- a. What is proposed?*
- b. Where will the action take place?*
- c. When will the action take place?*
- d. What design and standards will apply?*
- e. What methods and techniques will be used?*
- f. How long will it take to complete the action?*
- g. Why is it being proposed in this manner?*
- h. What mitigation will take place to minimize the impact?*

*Analysis:*



**Alternative 3 – \_\_\_\_\_**

*a. What is proposed?*

*b. Where will the action take place?*

*c. When will the action take place?*

*d. What design and standards will apply?*

*e. What methods and techniques will be used?*

*f. How long will it take to complete the action?*

*g. Why is it being proposed in this manner?*

*h. What mitigation will take place to minimize the impact?*

***Analysis:***

**Alternative 4 – \_\_\_\_\_**

- a. What is proposed?*
- b. Where will the action take place?*
- c. When will the action take place?*
- d. What design and standards will apply?*
- e. What methods and techniques will be used?*
- f. How long will it take to complete the action?*
- g. Why is it being proposed in this manner?*
- h. What mitigation will take place to minimize the impact?*

*Analysis:*

## IMPACTS OF EACH ALTERNATIVE

**Alternative 1:**

- 1) Biophysical effects:
- 2) Social/Recreational/Experiential effects:
- 3) Societal/Political effects:
- 4) Health/Safety concerns:
- 5) Economic/Timing considerations:

1. Biophysical effects:
2. Social/Recreational/Experiential effects:
3. Societal/Political effects:
4. Health/Safety concerns:
5. Economic/Timing considerations:

1. Biophysical effects:
2. Social/Recreational/Experiential effects:
3. Societal/Political effects:
4. Health/Safety concerns:
5. Economic/Timing considerations:

1. Biophysical effects:
2. Social/Recreational/Experiential effects:
3. Societal/Political effects:
4. Health/Safety concerns:
5. Economic/Timing considerations:

## MINIMUM TOOL ANALYSIS WORKSHEET

## MINIMUM REQUIREMENT ANALYSIS WORKSHEET

### CONGAREE SWAMP NATIONAL MONUMENT

COSW-180 (7/2003)

**PROPOSED ACTION:** Prescribed Fire Preparation & Implementation Needs      **DATE:** 7/9/03  
**LEAD PERSON(S):** Patrick Dege      **WORK UNIT(S):** Burn Units 1 through 8

**PART A: Minimum Requirement** *(should the action be done in wilderness)*

|  |                                |
|--|--------------------------------|
| <b>1</b>   | <b>IS ACTION AN EMERGENCY?</b> |
| <div style="display: flex; justify-content: space-around;"> <span>YES</span> <span>NO</span> </div> <div style="display: flex; justify-content: space-around; margin-top: 20px;"> <div style="text-align: center;">             ↓<br/> <div style="background-color: #eee; padding: 5px; margin-top: 10px;">               ACT ACCORDING TO<br/>APPROVED EMERGENCY<br/>MINIMUM TOOL CRITERIA             </div> </div> <div style="text-align: center;">             ↓<br/> <div style="background-color: #eee; padding: 5px; margin-top: 10px;">               DOES ACTION CONFLICT WITH LEGISLATION,<br/>PLANNED WILDERNESS GOALS, OBJECTIVES<br/>OR FUTURE DESIRED CONDITIONS?             </div> </div> </div> |                                |
| <div style="display: flex; justify-content: space-around;"> <span>YES</span> <span>NO</span> </div> <div style="display: flex; justify-content: space-around; margin-top: 20px;"> <div style="text-align: center;">             ↓<br/> <div style="background-color: #eee; padding: 5px; margin-top: 10px;">               DO NOT DO IT             </div> </div> <div style="text-align: center;">             ↓<br/> <div style="background-color: #eee; padding: 5px; margin-top: 10px;"> <b>3</b><br/>IS ACTION PRE-APPROVED BY<br/>THE WILDERNESS AND BACKCOUNTRY<br/>OR OTHER PARK MANAGEMENT PLAN?             </div> </div> </div>   |                                |
| <div style="display: flex; justify-content: space-around;"> <span>YES</span> <span>NO</span> </div> <div style="display: flex; justify-content: space-around; margin-top: 20px;"> <div style="text-align: center;">             ↓<br/> <div style="background-color: #eee; padding: 5px; margin-top: 10px;">               DO ACCORDING TO<br/>APPROVED CRITERIA             </div> </div> <div style="text-align: center;">             ↓<br/> <div style="background-color: #eee; padding: 5px; margin-top: 10px;"> <b>4</b><br/>CAN ACTION BE ACCOMPLISHED<br/>THROUGH A LESS INTRUSIVE ACTION THAT<br/>SHOULD BE TRIED FIRST? (Visitor Education...)             </div> </div> </div>                          |                                |
| <div style="display: flex; justify-content: space-around;"> <span>YES</span> <span>NO</span> </div> <div style="display: flex; justify-content: space-around; margin-top: 20px;"> <div style="text-align: center;">             ↓<br/> <div style="background-color: #eee; padding: 5px; margin-top: 10px;">               DO IT             </div> </div> <div style="text-align: center;">             ↓           </div> </div>   |                                |

Answer: ☐ Yes ☒ No

Explain: The proposed action would reduce hazardous fuel accumulations and allow for the safe restoration of fire to the ecosystem near the park boundary adjacent to high-risk communities and developed areas. While no emergency is currently at hand, the action will facilitate the use of prescribed fire to reduce the threat to life and property during the event of future wildland fires.

Answer: ☐ Yes ☒ No

Explain: The Wildland Fire Management Plan states that actions taken to perform hazard fuel reduction projects will follow the minimum requirement concept. The Resource Management Plan and the Fire Management Plan call for the use of hazard fuel reduction and prescribed fire as critical management tools.

Answer: ☐ Yes ☒ No

Explain: The action is not pre-approved by a park management plan. The action is supported in the Resource Management Plan and the Fire Management Plan. The minimum requirement analysis is conducted per the Wildland Fire Management Plan and associated environmental assessment for such actions within wilderness.

Answer: ☐ Yes ☒ No

Explain: The removal of natural vegetation and dead and down fuels is required to reduce the risk of wildland fire to life and property. Prescribed fire is the least intrusive (and most natural) action available. Using motorized tools for the safe and effective preparation and implementation of prescribed fire is critical.

|   |  |   |
|---|--|---|
| <b>5</b>  | CAN ACTION BE ACCOMPLISHED OUTSIDE OF WILDERNESS AND STILL ACHIEVE ITS OBJECTIVES?   | Answer: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No   |
|   | <p>YES      NO</p> <p>↓      ↓</p> <p>DO IT THERE      DO PART B</p>   | <p>Explain: The preparatory work needed to implement the prescribed fire project extends into designated or potential wilderness. It is necessary to construct control lines on the perimeter of the burn unit for safe implementation. Work within designated/potential wilderness prior to ignition as well as during ignition is addressed in this analysis.</p>                                 |
| <b>PART B: Minimum Tool (how the action should be done in wilderness)</b> |  |   |
| <b>6</b>  | DESCRIBE, IN DETAIL, ALTERNATIVE WAYS TO ACCOMPLISH THE PROPOSED ACTION *<br>(These may include, primitive skill/tool, mechanized/motorized, and/or combination alternatives)<br>(Use addition pages if necessary) | * Minimum questions to answer for each alternative:<br>What is proposed?<br>Where will the action take place?<br>When will the action take place?<br>What design and standards will apply?<br>What methods and techniques will be used?<br>How long will it take to complete the action?<br>Why is it being proposed in this manner?<br>What mitigation will take place to minimize action impacts? |
|   | GO TO NEXT STEP  |   |
| <b>7</b>  | EVALUATE WHICH ALTERNATIVE WOULD HAVE THE LEAST OVERALL IMPACT ON WILDERNESS RESOURCES, CHARACTER AND VISITOR EXPERIENCE **  | ** Minimum criteria used to evaluate each alternative:<br>Biophysical effects<br>Social/Recreational/Experiential effects<br>Societal/Political effects<br>Health/Safety concerns<br>Economical/Timing considerations   |
|   | GO TO NEXT STEP  |   |
| <b>8</b>  | SELECT AN APPROPRIATE,   | IF<br>→<br>REQUIRED   |
|   |  | <b>9</b> ATTACH TO APPROPRIATE PROJECT PROPOSAL/CLEARANCE FORM FOR REVIEW AND APPROVAL/DISAPPROVAL SIGNATURE  |

### PROJECT SUMMARY:

In response to the impacts of the 2000 fire season on urban interface communities, a National Fire Plan was developed that focuses on identifying communities at high risk from wildland fire and mitigating these risks through hazard fuel reduction efforts. The Wildland/Urban Interface initiative was enacted in 2001 that supported hazard fuel reduction projects adjacent to high-risk communities.

At Congaree Swamp National Monument, the presence of vegetation characterized by moderate to high severity fire regimes and/or unnatural accumulations of fuels due to fire suppression actions and proximity of communities/structures to the Park's north boundary creates a high risk wildland/urban interface situation. Late summer prevailing wind patterns can exacerbate this situation. To help mitigate this risk, fire management is proposing to conduct a series of



prescribed fires over the next six years (2003 to 2008) to reduce hazardous fuels along the monument's northern boundary. These areas are delineated in the Wildland Fire Management Plan (WFMP) as Burn Units 1 through 8. Burning these units would help strengthen hazard fuel reduction activities (prescribed fires and mechanical fuel treatments) that have taken place between the northern boundary and the park's interior. These prescribed burn units are part of the original five year prescribed fire plan designed to restore the natural process of fire to the ecosystem as well as reduce fuel accumulations to further protect our neighbors to the north from catastrophic wildfire.

The primary goals of these prescribed fire projects are to reduce the risk of wildland fire to life and property. This will be accomplished by altering fuel loading, both surface as well as canopy, in order to modify fire behavior to a level that is safer and easier to control by firefighters in the event of a wildland fire. Specific project goals and objectives include:

Goals:

1. Within the pine plantation areas and abandoned fields:
  - Convert the sites to a more natural wilderness area
2. Within the scattered mature pine areas:
  - Improve wildlife habitat
  - Restore the historic fire regime
3. Entire Unit:
  - Hazardous fuel reduction
  - Improve endangered species habitat (Red cockaded woodpecker)

Objectives:

- Provide for firefighter and public safety
- Reduce litter and 1 and 10 hr woody fuel loads by >50% as measured immediately post-burn
- Achieve mortality on >50% of pole size trees as measured one year post-burn
- Limit mortality to less than 10% of overstory Longleaf pine as measured 2 years post-burn
- Limit mortality to less than 20% of overstory Loblolly pine as measured 2 years post-burn

Ultimately, the prescribed fire project will benefit wilderness values on a landscape level by minimizing the need for continued fire suppression and allowing fire to be managed in a manner that more readily mimics natural fire regimes and perpetuates natural processes.

To complete this prescribed fire project in a safe, effective, and controlled manner, first it will be crucial to prepare the unit perimeter by removing jackpot fuels as well as adjacent ladder fuels. In addition, during implementation of the burn it will be necessary to utilize water to maintain safe control of the fire. Prior to conducting the prescribed fire, notifications must be

given and permit numbers obtained from the South Carolina Forestry Commission. Additionally a prescribed burn plan for each scheduled burn will be prepared and approved prior to implementation in order to further delineate the ground operations of the burn.

This minimum requirement analysis is intended to determine tool use for the completion of the prescribed fire projects located along the northern boundary of the monument and as delineated in the WFMP as Burn Units 1 through 8, portions of which are within designated and/or potential wilderness.

The following alternatives have been analyzed in order to determine the appropriate tools to use when preparing control lines, implementing, monitoring and rehabilitating the aforementioned Prescribed Fire Projects: 1) No Action; 2) Primitive Tools Only; 3) Unrestricted Use of Non-Primitive Tools; and 4) Combination – Primitive Tools and Restricted Use of Mechanized/Motorized Tools.

### **Alternative 1 - No Action**

- a. What is proposed?*  
No action.
- b. Where will the action take place?*  
N / A
- c. When will the action take place?*  
N / A
- d. What design and standards will apply?*  
N / A
- e. What methods and techniques will be used?*  
N / A
- f. How long will it take to complete the action?*  
N / A
- g. Why is it being proposed in this manner?*  
N / A
- h. What mitigation will take place to minimize the impact?*  
N / A

**Analysis:** No preparation work would take place and no prescribed fire projects would be implemented. This alternative would allow for the continued accumulation of dead and down woody debris and dense vegetative conditions that could eventually lead to extreme fire behavior during a wildland fire. The risk to life and property would increase with time as the potential for extreme fire behavior increases. Park management would be restricted in the use of wildland fire used for resource benefit given the risk to adjacent communities in the event of fire escape. Suppression would be the primary management response to wildland fire ignitions in most areas on the north side of the park. Actions taken to suppress fires are often destructive to the environment and are not compatible with wilderness values. Absence of fire will continue to alter natural conditions within designated and potential wilderness and may result in negative impacts to forest ecosystems and loss of species due to habitat change and lack of disturbance.

## Alternative 2 – Primitive Tools Only

### ***a. What is proposed?***

Conduct prescribed fire using primitive tools only, such as pruning shears, crosscut and hand saws, axes, hand scythes, bladder bags, handheld weather instruments, and non-mechanized/non-motorized water delivery systems in project areas during preparation work and execution of prescribed fire projects.

### ***b. Where will the action take place?***

Within, along and adjacent to each Prescribed Burn Unit (see project map).

### ***c. When will the action take place?***

Prescribed burn projects will begin between late spring and fall of each year (or later) depending on weather and fuel conditions. Control line prep work will begin prior to burn execution, preferably in spring or early summer of each year.

### ***d. What design and standards will apply?***

The Prescribed Burn Plan for each scheduled burn will comply with Chapter 10 of RM-18 requirements. Burn Plans include fire behavior modeling to determine a prescription that facilitates the safe execution of the prescribed fire as well as one that reduces fuel accumulations that will result in reduced fire behavior in the future. Restoring the natural role of fire to the environment is also a project goal.

### ***e. What methods and techniques will be used?***

Under this alternative pruning shears, council rakes, Mcleods, crosscut and hand saws would be used for removing trees and branches as well as dead and down material that would compromise the integrity of the control line. Bladder bags would be used for wetting adjacent non-target fuels as well as vegetation within a burn unit to reduce fire intensity. Gravity socks from porta-tanks positioned near roads would be utilized for delivering water to burn units. Handheld weather instruments would be used within designated/potential wilderness and observations recorded.

### ***f. How long will it take to complete the action?***

Under this alternative completion of unit preparation work could take many months. In addition the execution of prescribed burns would take much longer since it would require that each burn unit be divided into much smaller subunits to safely conduct prescribed fire. It is estimated that preparation work and implementation under this alternative would take 1-2 years.

### ***g. Why is it being proposed in this manner?***

It is being proposed in this manner to strictly comply with the use of primitive tools to protect wilderness values.

### ***h. What mitigation will take place to minimize the impact?***

Since this is the least intrusive, no additional mitigation to reduce impact can be utilized and still complete the project.

***Analysis:*** Conducting prescribed fire using primitive tools only would necessitate breaking each burn unit into much smaller subunits to allow for the safe execution of prescribed fire. Burning in smaller subunits would require more established control lines, thus more impact to the wilderness environment.

Using primitive tools alone would increase the duration of each project because a reduction in the acreage burned per day would be needed to safely execute burns. In addition, even more fire personnel (see Appendix 10 of the burn plan) would be needed, thus increasing project costs and delaying the benefits of prescribed fire treatments. A much more conservative burn prescription would need to be applied to safely execute each burn, thus potentially reducing the ability to accomplish burn objectives. Safety of project personnel would be compromised in the event of escape fires due to the increased exposure to hazards during suppression activities. Using handheld weather instruments only would limit the environmental information that is needed for fire managers to make sound decisions regarding the implementation of prescribed fire. The use of primitive tools alone to complete prescribed fire projects would likely inhibit project completion due to safety concerns, unacceptable project costs, and substantial project delays.

### **Alternative 3 – Unrestricted Use of Non-primitive Tools**

***a. What is proposed?***

Conduct prescribed fire allowing full use of mechanized/motorized equipment such as automated weather station, helicopter, engines, portable pumps, sprinkler systems, cord trimmers, and chainsaws in the project area during preparation work and execution of the Prescribed Fire Projects.

***b. Where will the action take place?***

Within, along and adjacent to the Prescribed Burn Unit (see project map).

***c. When will the action take place?***

The prescribed burn project will begin sometime between spring and fall of each year (or later) depending on weather and fuel conditions. The control line preparation work will occur prior to the burn execution, preferably in spring or early summer of each year.

***d. What design and standards will apply?***

The Prescribed Burn Plan for each scheduled burn will comply with Chapter 10 of RM-18 requirements. Burn Plans include fire behavior modeling to determine a prescription that facilitates the safe execution of the prescribed fire as well as one that reduces fuel accumulations that will result in reduced fire behavior in the future. Restoring the natural role of fire to the environment is also a project goal.

***e. What methods and techniques will be used?***

Chainsaws and cord trimmers will be utilized to prepare control lines prior to the execution of the prescribed burn. This involves the removal of dead and down material as well as trees and brush that might present a threat near the control lines. A portable weather station may be set up within the burn unit for recording weather observations in accordance with NPS requirements. Just prior to and on the day of burn execution, engines, portable pumps and sprinklers may be used to adequately wet fuels to allow the safe execution of the prescribed burn. If needed, a helicopter may be utilized as an aerial platform for reconnaissance during ignition as well as for suppression purposes.

***f. How long will it take to complete the action?***

With the unrestricted use of the above tools the preparation of the unit would take only about 1-2 weeks. Execution of the prescribed burn would be much faster with helicopter reconnaissance, allowing for quicker and more aggressive ignition as well as suppression

activities. It is estimated that ignition could be completed within a few days utilizing this alternative.

***g. Why is it being proposed in this manner?***

Using non-primitive tools would facilitate the most effective and timely implementation of prescribed fire projects. Using an automated weather station will provide fire managers with information that will help provide the knowledge of when and how the prescribed fire should be executed. The use of a helicopter, engines, portable pumps and sprinkler systems will ensure safe and efficient means for controlling potential spot fires or slopovers. Chainsaws would provide an efficient and safe method of preparing control lines as well as suppressing fires.

***h. What mitigation will take place to minimize the impact?***

The prep work will be completed as early in the spring or summer as possible to minimize the visual and auditory impact to visitors. Saw cuts will be camouflaged as much as possible in high visibility areas. The prep work will be completed in the fewest days possible by utilizing a large number of personnel in order to reduce the number of days of visitor / wildlife impact. Because of the relative ease with which portable pumps and sprinkler systems can be set up, these tools will not need to be deployed until a few days or so prior to planned burn execution. The portable weather station will be located in an unobtrusive area of the burn unit. Constructed fireline will be rehabbed following the prescribed burn. No chemical agents (such as foam) will be added to the water unless it is necessary for the saving of life or significant property, and is approved by the agency administrator or their representative. Portable pumps (and associated fuel cans) inside and outside the designated/potential wilderness will be placed on plastic/absorbent sheeting to prevent fuel spills onto the ground or into streams.

***Analysis:*** Conducting prescribed fire projects allowing the full use of mechanized/motorized equipment would provide a cost-effective and safe preparation and implementation of prescribed burns. Through the use of non-primitive tools, larger subunits could be burned at one time, thereby reducing environmental impact caused by the need to create more fire control lines if these tools were not utilized. Completing prescribed burns will reduce fuel accumulations, thus reducing risks to life and property. In addition, designated/potential wilderness areas would benefit from the restoration of fire to its natural role in the ecosystem.

## **Alternative 4 – Combination – Primitive Tools and Restricted Use of Mechanized/Motorized Tools**

***a. What is proposed?***

Conduct prescribed fire using a combination of primitive tools and mechanized/motorized equipment. Primitive tools (handsaws, crosscut saws, axes, and pruning shears) would be utilized within the designated/potential wilderness to the extent possible. Restrict the use of portable pumps (where possible), engines, weather station, and helicopter to outside the designated/potential wilderness area, unless the helicopter is needed for emergency suppression of spot fires or slopovers. A combination of chainsaws and handsaws would be used to prepare the control lines for project execution. Cord trimmers would be used minimally to prepare control lines through grassy areas.

***b. Where will the action take place?***

Within, along and adjacent to the Prescribed Burn Units (see project map).

***c. When will the action take place?***

Prescribed burn projects will begin between spring and fall of each year (or later) depending on weather and fuel conditions. Control line prep work will occur prior to burn execution, preferably in spring or early summer of each year.

***d. What design and standards will apply?***

Prescribed Burn Plan for each scheduled burn will comply with Chapter 10 of RM-18 requirements. Burn Plans include fire behavior modeling to determine a prescription that facilitates the safe execution of the prescribed fire as well as one that reduces fuel accumulations that will result in reduced fire behavior in the future. Restoring the natural role of fire to the environment is also a project goal.

***e. What methods and techniques will be used?***

A combination of pruning shears, axes, handsaws and chainsaws will be utilized to prepare control lines within designated/potential wilderness prior to the execution of prescribed burns. Handsaws, axes, and/or pruning shears will be used to the extent possible where fire personnel safety would not be compromised. Chainsaws would be used for felling trees and cutting large down and dead material. A portable weather station may be set up just inside the burn unit (but outside the designated/potential wilderness, where feasible) for recording weather observations. Just prior to and on the day of burn execution, portable pumps and sprinklers will be used to adequately wet fuels to ensure the controlled execution of the prescribed fire. Engines will only be stationed along the roads in the non-wilderness corridor, except in the event of an escape fire (emergency).

***f. How long will it take to complete the action?***

Using chainsaws and blowers in addition to hand tools will reduce the prep work from several months (if only primitive tools are used) to possibly 2 weeks. The ignition phase of the burn could be accomplished in 3 days or less as opposed to many weeks without the use of the helicopter (for emergencies), engines, sprinklers and pumps.

***g. Why is it being proposed in this manner?***

The work is being proposed in this manner to protect wilderness values to the extent possible but still facilitate the effective safe and timely implementation of the prescribed fire project. Locating the portable weather station in non-wilderness, although not ideal, will provide adequate information. Using handsaws, axes, and pruning shears where possible will slow the prep work somewhat but help minimize the impacts of power tools within the designated/potential wilderness. The use of chainsaws for felling trees and cutting large dead and down fuels along control lines will increase safety by minimizing exposure of fire personnel to the dangers associated with hand sawing. In addition, using chainsaws will expedite the prep work and in return allow the prescribed fire to occur sooner, thus reducing the risk of high intensity, damaging wildfire. Utilizing a blowers and/or a cord trimmer rather than a hand scythe would be safer and more efficient, as well as more effective for preparing control lines in grassy areas. Its use would also minimize the amount of ground disturbance that would be required. There is no prudent way to execute a burn without using portable pumps and sprinklers to help maintain control of the burn. The use of portable pumps and sprinkler systems will help ensure safe and efficient means for controlling potential spot fires or slopovers. The use of a helicopter and chainsaws would provide the most efficient methods of suppressing fires.

***h. What mitigation will take place to minimize the impact?***

The prep work will be completed as early in the spring or summer as possible to minimize the visual and auditory impact to visitors. Saw cuts will be camouflaged as much as possible in high visibility areas. The prep work will be completed utilizing a large number of personnel in order to reduce the number of days of visitor/wildlife impact. Because of the relative ease with which portable pumps and sprinkler systems can be set up, these tools will not need to be deployed until a few days prior to planned burn execution. The portable weather station will be located in an unobtrusive area at the edge of a given burn unit, outside the wilderness area where feasible. The helicopter (if needed) will be on call and utilized for emergencies only. Constructed fireline will be rehabbed following the completion of each prescribed burn. No chemical agents (such as foam) will be added to the water unless it is necessary for the saving of life or significant property, and is approved by the agency administrator or his/her representative. Portable pumps (and associated fuel cans) inside and outside the designated/potential wilderness will be placed on plastic/absorbent sheeting to prevent fuel spills onto the ground or into streams.

***Analysis:*** This combination alternative utilizes both primitive tools as well as the restricted use of mechanized/motorized equipment. Some tools such as the weather station, most of the portable pumps, engines and the helicopter (except in the event of an emergency) will be operated outside (but adjacent to) the designated/potential wilderness. Primitive tools would be utilized to the extent possible within the interior of a burn unit where the safety of fire personnel will not be compromised. This alternative is a compromise between the unrestricted use of mechanized/motorized equipment and the complete use of primitive tools. The ability to use some non-primitive tools in designated/potential wilderness would help expedite unit preparations as well as increase efficiency and safety of prescribed fire implementation. In addition, because larger subunits could be burned under this alternative, fewer control lines would be needed, thus less resource damage would occur.

***Preferred alternative:*** Alternative 4. ***Justification:*** This combination alternative provides the most efficient method of implementing prescribed fire while still protecting wilderness values within the project areas. Allowing the limited use of mechanized/motorized equipment as tools needed for control line preparation, monitoring, holding operations and for possible suppression activities in designated/potential wilderness would minimize impacts to wilderness values while providing a method of safely implementing prescribed fire. This will ultimately reduce risks of catastrophic wildland fire to life and property, thus perpetuating natural processes which are commensurate with wilderness values.

## IMPACTS OF EACH ALTERNATIVE

### ***Alternative 1: No Action***

- 1) Biophysical effects: Not conducting Prescribed Fire Projects would limit park management's ability to use fire as a resource management tool. Fire is a key element in forest ecosystems in and adjacent to Congaree Swamp National Monument. The continued absence of fire will alter the natural conditions of designated/potential wilderness and may result in loss of fire dependent species. Suppression-only would not be an appropriate management response for most areas on the north side of the park due to the prevailing wind patterns and continuous fuels leading into developed areas.
- 2) Social/Recreational/Experiential effects: No impact would be foreseen in the short term. However, in the event of unwanted wildland fire, suppression operations and/or evacuations and park closures could cause severe social/recreational/experiential impacts.
- 3) Societal/Political effects: Hazard fuel reduction projects, and, subsequently, prescribed fires, are federally mandated by the National Fire Plan to help protect life and property in close proximity to urban areas. The no-action alternative would deviate from this federal mandate. In the event of unwanted wildland fire, the lack of fuel treatments in and around developed areas may result in loss of life and property.
- 4) Health/Safety concerns: The risk to life and safety would increase over time as fuels continue to accumulate near developed areas. This would create conditions favorable for extreme fire behavior. In the event of unwanted wildland fire, lack of treated fuels would create fire behavior that would be more difficult to control. Given the proximity of communities and high densities of visitors during times of peak fire danger, the risk to life and property would continue to increase over time.
- 5) Economic/Timing considerations: No action at this time would result in higher costs in the future with suppression costs and/or reimbursement costs of property losses or lawsuits.

### ***Alternative 2: Use of Primitive Tools only***

Prescribed fire projects would be conducted using primitive tools only, including handheld weather instruments (no means of recording 24 hour data), bladder bags, and other non-mechanized/motorized water delivery systems, and only cross-cut saws or axes to suppress a spot fire or slopover.

At this time there is no known non-motorized water delivery system that could adequately be used to quickly attack spot fires. Because of the near impossibility of executing the burn safely and efficiently with only primitive tools, the prescribed fire would not take place therefore this alternative would be the same as the NO ACTION alternative.



### ***Alternative 3: Unrestricted Use of Mechanized/Motorized Equipment***

- 1) Biophysical effects: Prescribed fires would be conducted using mechanized/motorized equipment in each project area. The completion of prescribed fires would alter the current forest structure by increasing the live canopy spacing through the mortality of small trees and reducing dead and down fuels, thus creating a more open, natural forest featuring longleaf pine and related community types. In the event of a future unwanted wildland fire, prescribed fire areas could be used by fire fighting personnel to safely help slow and/or stop fire spread. The use of fire as a resource management tool would ultimately benefit wilderness values on a landscape level within the park. By allowing fire to occur, natural processes would be perpetuated and fire-dependent ecosystems/species would benefit.
- 2) Social/Recreational/Experiential effects: Short-term effects would include the associated noise, emission odors as well as visual impacts of equipment to hikers and other visitors. Project duration (perhaps up to 2 to 4 weeks) would be minimized through the use of mechanized/motorized equipment therefore reducing long-term impacts to visitors. Mitigation of impacts includes public education and project scheduling (prior to high visitor use times).
- 3) Societal/Political effects: Prescribed Fires (as hazard fuel reduction) projects are federally mandated by the National Fire Plan to help protect life and property in close proximity to urban areas. Conducting prescribed fire projects would reduce the risk of wildland fire to life and property.
- 4) Health/Safety concerns: Future health and safety concerns would be lessened through the reduction in fuel loading from the completion of prescribed fire projects. Mechanized/motorized equipment (such as helicopter, engines, pumps, sprinkler systems, chainsaws) are considered the safest and quickest tools for conducting prescribed fire projects because they reduce the exposure of firefighters to the hazards of fire suppression efforts in the event of an escape fire. In addition, the ability to use equipment as holding-resources for the execution of burns will significantly reduce the possibility of an escape fire that could threaten nearby private stakeholders. Mechanized/motorized equipment use is generally less strenuous than using primitive tools, therefore reducing the risk of fatigue-related injuries and accidents. Project objectives would be achieved more quickly and safety benefits of the reduction of hazardous fuels through prescribed fire would be in place sooner.
- 5) Economic/Timing considerations: Using mechanized/motorized equipment has the most beneficial effects with respect to safety, economic and timing considerations. The use of mechanized/motorized equipment would expedite project completion and be the most economical method for reducing fuel accumulations as well as being the safest way to accomplish prescribed fires. This, in turn, would provide more acceptable project costs and the fastest risk reduction of wildland fire to life and property. It would also help mitigate project impacts related to social, recreational, experiential, health, and safety through minimizing project duration.

***Alternative 4 – Combination Alternative: Utilize primitive tools during prep work to the extent possible, as long as fire personnel safety is not compromised. Otherwise allow the use of chainsaws, blowers, and cord trimmers. Restrict the use of the most intrusive mechanized/motorized equipment (engines, most portable pumps, automated weather station) to just outside designated/potential wilderness but allow chainsaws, limited portable pumps and sprinkler systems in designated/potential wilderness to allow for the safe and efficient execution of prescribed fires. A helicopter would be on standby (if called for in the burn plan) and would be used for emergency purposes only.***

- 1) Biophysical effects: Prescribed fires would be conducted by restricting (as much as possible) the use of the most intrusive mechanized/motorized equipment (engines, most portable pumps, automated weather station and smoke monitor) to just outside the wilderness. However, the use of ATV's, chainsaws, limited portable pumps, and sprinkler systems in designated/potential wilderness would be permitted to allow for the safe and efficient execution of prescribed fires. Each prescribed fire would alter the current forest structure by increasing the live canopy spacing through the mortality of small trees and reducing dead and down fuels, thus creating a more open, natural forest featuring native longleaf pine and related community types. In the event of a future unwanted wildland fire, prescribed fire areas could be used by fire fighting personnel to safely help slow and/or stop fire spread. The use of fire as a resource management tool would ultimately benefit wilderness values on a landscape level within the park. By allowing fire to occur, natural processes would be perpetuated and fire dependent ecosystems/species would benefit.
- 2) Social/Recreational/Experiential effects: Short-term effects would include the associated noise, emission odors as well as visual impacts of equipment to hikers and other visitors. Project duration (perhaps 2 to 4 weeks) would be minimized through the use of mechanized/motorized equipment therefore reducing long-term impacts to visitors. Mitigation of impacts includes public education and project scheduling (outside high visitor use times).
- 3) Societal/Political effects: Prescribed fire (as hazard fuel reduction) projects are federally mandated by the National Fire Plan to help protect life and property in close proximity to urban areas. Conducting hazard fuel reduction projects would reduce the risk of catastrophic wildland fire to life and property.
- 4) Health/Safety concerns: Future health and safety concerns would be lessened through the reduction in fuel loading from the completion of prescribed fire projects. The mechanized/motorized equipment to be used in designated/potential wilderness (a helicopter, limited portable pumps, sprinkler systems, ATV's, and chainsaws) are considered the safest and quickest tools for conducting prescribed fire projects because they reduce the exposure of firefighters to the hazards of fire suppression efforts in the event of an escape fire. In addition, the ability to use some of the equipment during holding operations for the execution of the burn will significantly reduce the possibility of an escape fire that could threaten nearby private stakeholders. Mechanized/motorized

equipment use is generally less strenuous than using primitive tools, therefore reducing the risk of fatigue-related injuries and accidents. Using primitive tools (handsaws, axes, and pruning shears) for some removal of woody (small diameter) material should not present a safety concern. However, it will be necessary to use chainsaws for felling trees so fire personnel safety is not compromised. Project objectives would be achieved more quickly than using primitive tools only and safety benefits of the reduction of hazardous fuels through prescribed fire would be in place sooner.

- 5) Economic/Timing considerations: This combination alternative of using mechanized/motorized equipment as well as primitive tools to the extent possible will not be as efficient as the unrestricted use of non-primitive tools, but it will be more conducive to preserving wilderness values. Although this alternative would not facilitate the completion of prescribed fires as expeditiously and economically as Alternative 3, it is a reasonable compromise between all primitive tools (Alternative 2) and all mechanized/motorized tools (Alternative 3).

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